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Wealth Effects of the Gramm-Leach-Bliley Act on Financial Services Industry

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Wealth Effects of the Gramm-Leach-Bliley Act on Financial Services Industry

A Dissertation

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
The Department of Economics and Finance

by

Abdullah Al Mamun

M.A., University of Western Ontario, 1999

May 2003

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DEDICATION

To my Nana who taught me
‘There is no shortcut to learning.’

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Abstract

Gramm-Leach-Bliley Act (GLBA) was signed into law on November 12, 1999. This act is regarded as the most influential deregulation for the U.S. financial services industry in the past one-century. The purpose of this study is to determine and analyze the wealth effects of the GLBA on U.S. and foreign banks and insurance companies.

This dissertation is composed of four separate essays. In the first two chapters I investigate the wealth effects of the GLBA on domestic banks and insurance companies. I find that Money Center Banks followed by Super Regional Banks benefit most from this deregulation. I also find that banks with Section 20 investment subsidiaries benefit more than rest of the industry. For all types of banks exposure to systematic risk reduces following the enactment of the GLBA. In cross sectional analysis I find that banks size and change in exposure to systematic risk can explain the wealth effects at firm level.

In the domestic insurance industry, property/casualty and life insurance companies have the highest wealth effect. Exposure to systematic risk also reduces for all types of insurance companies following the enactment of the GLBA. From cross sectional analysis I find that diversification opportunities and safeguards against excessive risk taking create value for property/casualty and all other (except life) insurance companies. I also test merger related hypothesis. The result shows that poor performing firms and larger firms gain more from this deregulation.

In the third and fourth chapter I investigate the wealth effects of the GLBA on international banks and foreign insurance companies. I find that the events leading to the passage of the GLBA have significant negative wealth effects (spill-over effects) on the portfolios of banks and insurance companies for most of the developed countries I analyze. These effects are not same for any two countries. Most importantly I find that reduction in diversification opportunities for international banks and foreign insurance companies in the U.S. market can explain the wealth effects at firm level from the GLBA.

CHAPTER I:

INTRODUCTION

This study examines the impact of the Financial Services Modernization Act of 1999 (also known as the Gramm-Leach-Bliley Act (GLBA)) on the stockholder returns of banking and insurance industry, domestically and internationally. It also examines the factors that can explain the cross sectional variation of returns. On November 12, 1999, President Clinton signed the GLBA into law. This law officially ends the Depression era Glass-Steagall Act of 1933, that prohibits commercial banks from entering investment banking, and ends the Bank Holding Company Act of 1956, which prohibits commercial banks from insurance underwriting. It allows banks, brokerage firms, and insurance companies to merge. In addition, newly created Financial Holding Companies (FHC) may engage in a wider range of activities, including insurance underwriting, securities activity, merchant banking, and real estate development. Existing banks can extend insurance and investment activity using their subsidiaries.

The GLBA is the most sweeping deregulation of the U.S. financial services industry in the last century. To comprehend the impact, one should look at the major change brought in by the major provisions. Since the passage of law, a total of 591 FHC were created (as of November 30, 2001). The FHC is the centerpiece of the GLBA. Once a financial firm obtains the FHC designation, it can house a complete family of financial activities. The Glass-Steagall Act is said to have limited the financial institutions' ability

to pursue economies of scope¹, while it is argued that GLBA has created opportunities for domestic as well as international financial intermediaries.

1.1 History of Regulation in the US Financial Services Industry from Glass-Steagall to Gramm-Leach-Bliley

Thousands of banks failed in the years (1930-1933) following the stock market crash of 1929; as a result, it seems natural to make a connection between bank runs and bank involvement in the securities business. The Glass-Steagall Act was enacted to protect consumers and the economy from a conflict of interest of banking conglomerates in the security business. It created a highly regimented financial industry, in which commercial banks were limited to lending and deposit gathering. Thrifts were mortgage lenders, investment banks served as underwriters and brokers of both stock and bonds, and insurance firms were providers of actuarial products. Congress left the framework to encourage the state prohibitions on branch banking. It also established the Federal Deposit Insurance Corporation (FDIC) and raised minimum capital requirements for national banks. The Bank Holding Company Act (BHC) of 1956, on the other hand, prohibited banking firms from non-banking activities; as such, it closed bank involvement in the insurance business.

At the state level, the deregulation of depression era laws started in Maine when it permitted out of state branching. At the national level, deregulation began in 1980 when Congress allowed banks to offer competitive interest rates on deposits. The Garn-St. Germain Act of 1982 allowed banks to enter cross state boundaries to acquire troubled banks. In 1983, the Federal Reserve allowed Bank Holding Companies (BHC) to acquire

¹ Benston 1996, and Rajan 1996

discount security brokers. Ultimately, in 1987, the Federal Reserve allowed BHCs to underwrite certain 'bank ineligible' securities through the Section 20 investment subsidiary with a cap on the revenue from 'ineligible' activities to be 5%. The Federal Reserve increased the revenue limit from 'ineligible' activities twice, once in 1989 (to 10%) and the last time in 1997 (to 25%). Due to the restriction on revenue, only the largest of the banks (only 40) had a full line of investment banking. The 1994 Riegle-Neale Banking and Branching Efficiency Act removed constraints on bank holding company acquisitions across state lines, and also permitted banks to branch interstate if permitted by state law.

Other federal authorities also allowed banks to get involved in securities services. For example, the Office of the Comptroller of the Currency (OCC) in 1996 allowed subsidiaries of national banks to offer a wider range of securities activities under some restrictions. The Federal Deposit Insurance Corporation (FDIC) in 1984 ruled that non-member banks are not subject to Glass-Steagall restrictions, and in 1987 it further amended the previous ruling by eliminating the operational separation between banks and their subsidiaries. The present effort of financial modernization began in 1995 when Representative Jim Leach became the chair of the House Banking Committee. Leach first introduced the financial services modernization bill in Congress. The last attempt to repeal the Glass-Steagall was in 1998 when the bill was blocked on the Community Reinvestment Act (CRA) provision.

1.2 GLBA and the Domestic Financial Services Industry

The centerpiece created by the GLB is the *Financial Holding Company* (FHC). BHCs and foreign banks that meet certain criteria can become a FHC. All depository

institutions must be well managed and well capitalized to become a FHC. If the FHC or foreign bank fails to meet any such standards after they became FHC, they have 180 days to correct it or the Federal Reserve (FED) may order the company to divest or terminate its financial activities or depository subsidiaries. No declaration to become FHC is effective under the GLBA unless each of its depository subsidiaries has at least a satisfactory or better rating under the Community Reinvestment Act (CRA). If any of the FHC's depository subsidiaries falls short of a satisfactory CRA rating, the FED may ask the company not to acquire any other company or get involved in any additional financial activity. The act authorizes the FHCs to engage in a wider range of activity under the extended power granted by the GLBA. These activities may be financial in nature like securities underwriting and dealing, insurance agency and underwriting activities, and merchant banking activities. The FED may also allow additional activities after consultation with the Secretary of the Treasury (it may be non-financial activity complementary to financial activity as long as it does not pose substantial risk to the depository institute). The FHC does not need prior permission from the FED to acquire a financial company, but it has to notify the FED within 30 days of doing such.

The GLBA authorizes extended powers to banks. Well-capitalized banks can underwrite and deal in municipal revenue bonds. Financial subsidiaries of a national bank may engage in activities that are not permitted of national banks. However, a financial subsidiary of the national bank may not engage as a principal in underwriting insurance, providing or issuing annuities, nor is it allowed to engage in real estate development or investment, merchant banking or complementary activities that are allowed to affiliates of the FHC. Under the new law national banks may continue to engage in insurance

activities from any region with a population of five thousand or less. National banks are also required to have prior OCC permission to conduct activities through the financial subsidiary. State member banks can own or control a subsidiary engaging in all the activities allowed to the financial subsidiary of a national bank conditional on compliance with the same regulations as national banks. State banks may also engage as principals in activities not allowed to national banks conditional on the approval of the FDIC.

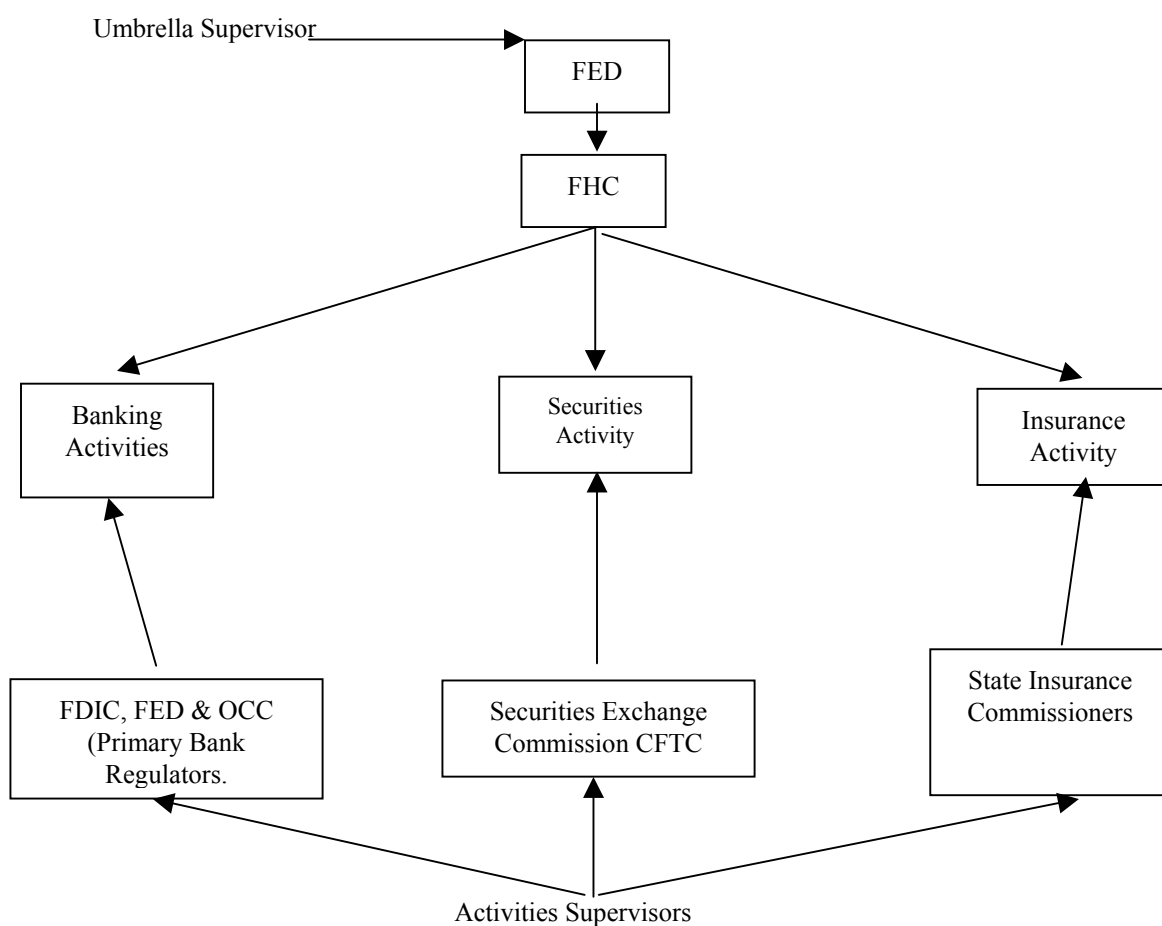


Fig 1: Supervisory Structure of FHCs under GLBA.

The FED is going to serve as the overall supervisor of the FHCs and traditional regulators will oversee their business activities (banking, investment and insurance). The

act contains several new regulations concerning the privacy of customer financial information. The GLBA requires the financial institution to provide the potential customer with their policies and practices regarding the collection and disclosure of non-public personal information to their affiliates and third parties. They are also required to update the customers regarding their policy at least annually. The act prohibits the disclosure of non-public private information to a non-affiliated third party without the approval of the customer and allows the customer to opt out from any such agreement. Financial institutions are generally prohibited under the law from disclosing non-public private consumer information to third party marketing programs, including telemarketing and direct mail programs.

Under the act, any insured depository institution with \$250 million or more in aggregate assets would be subject to a routine CRA examination. An institution will be examined for compliance with the CRA once every 5 years if it is given an ‘outstanding’ rating in the most recent CRA examination and once every four years if it is given a ‘satisfactory’ rating. Any institution that comes under the jurisdiction of the CRA must submit a report to the federal agency concerning the use of CRA related money and resources during the previous year.

1.3 GLBA and Foreign Financial Institutions

Under GLBA, international banks can engage in commercial banking, merchant banking and insurance in ways consistent with their business strategies. If the international bank becomes a Financial Holding Company (FHC) there is no limit to the revenue generated by its insurance activity, merchant banking activity or investment banking activity. To qualify for the FHC it must notify the Federal Reserve about the

activities in which it will engage and make certain required certifications to it. In order to become a FHC, its depository institution must be well capitalized and well managed and no insured institutions within the FHC can have less than satisfactory rating in Community Reinvestment Act (CRA).

International banks have to decide whether they should keep its current structure and continue to engage in current activities or engage in other and newer activities now permitted under the new regulation. If the international banks engage in the traditional commercial banking in US via a branch or agency it may still do so without changing the structure. But if the US branch or agency engages in certain securities, merchant banking or investment banking activities in the US, the operation has to be ceased unless they are grandfathered². Under the new regulation, the activity and not the entity determines the primary supervisory authority.

Most international banks that were engaged in significant insurance activities did so through a domestic bank or an insurance subsidiary of a domestic bank. Now the international banks have to operate via an existing licensed insurance subsidiary or establish new subsidiary and obtain license from state insurance department where it wants to sell the insurance to take full advantage of the opportunity provided by the new regulation.

Most of the international banks carry out their investment or merchant banking activities in US through Section 20 investment subsidiary. These banks can continue to engage in these activities so long as they are grandfathered, but they can't engage in new activities. Some of the international banks in the US engage in investment banking

² Grandfathered means the bank may continue to engage in the activity because it did so before the

through domestic banks and trust companies. These operations have to be terminated as the new law requires the international bank to engage in these activities through a US registered broker dealer.

In order to engage in any activity in US, an international bank has to be well capitalized and well managed by the standards set by FED. The Federal Reserve will review the worldwide operation of international banks to determine whether they can engage in commercial banking or any other activities in the US at all.

1.4 Literature Review

1.4.1 Literature on the impact of GLBA on domestic Financial Institutions

Hendershott, Lee, and Tompkins (2002) investigate the market response of the GLBA on the three major industries. While they did not find any market response for the commercial banks, they did however find a significantly positive wealth effect for the insurance and the brokerage industries only on one event. They argue that loopholes in the laws have long allowed banks to have a “fairly substantial presence in other sectors” as a reason to why there is no wealth effect for the commercial banks. For all 3 industries they find that not only does firm size matter but also that for commercial banks profitability can explain the cross-sectional variation in return. Similarly, Carow and Heron (2002) find that while brokerage firms and insurance companies benefit from the GLBA, banks do not. They also find negative returns for foreign banks, thrifts, and finance companies; larger non-depository firms have higher returns. Akhigbe and Whyte (2001), on the other hand, find that all three industries benefit from the provisions of GLBA and that larger and well-capitalized banks benefit more from this law. Brokerage

restrictions became law. New activities are not covered by the grandfather provision.

firms benefit regardless of size, but the gains are inversely related to capital position. Insurance companies benefit regardless of size and capitalization. Barth, Brumbaugh, and Wilcox (2000) argue that GLBA is just ratifying the "Status Quo" rather than being revolutionary, and that this law goes more in favor of the big banks and big financial institutions.

1.4.2 Literature on studies investigating major deregulations before GLBA

There are several studies that look at the major deregulations leading up to the Gramm-Leach-Bliley Act. Cornett, Ors and Tehranian (2002) examine the performance of commercial banks around the establishment of a Section 20 subsidiary. They find that Section 20 activities undertaken by commercial banks result in increased industry-adjusted operating cash flow return on assets, due mainly to revenues from non-commercial banking activities. The initial alliances of commercial banks and investment banks via the establishment of Section 20 subsidiaries have been beneficial to commercial bank performance and allowed commercial banks to diversify their activities with increased performance relative to the risk being undertaken. Cyree (2000) also finds similar results for increased investment banking powers for commercial banks, when the revenue limit for investment subsidiaries increased from 10% to 25%. He also finds that the larger banks benefit more than smaller banks. Ely and Robinson (1998) analyze the wealth effect on banking and security firms in the event of an increase in the revenue limit on bank security subsidiaries from 10% to 25%. They tried to predict the impact of the repeal of the Glass-Steagall Act would have on these two industries. They find that the expansion has a positive wealth effect around the announcement for most of the individual investment banks. This study also finds that this expansion has a positive

wealth effect for the banks, especially for the firms that already have a security subsidiary. Boyd, Graham, and Hewitt (1993) investigate the effect of bank holding company (BHC) mergers with non-bank financial firms using simulated data and find that BHC mergers with life and property/casualty insurance companies reduced risk. Irrespective of using market or accounting data they reach the same conclusion. Gande, Puri, and Saunders (1999) examine the competitive effects of commercial bank entry into the corporate debt underwriting market. They find that the underwriting spread and ex-ante yields have declined significantly with bank entry. The effect is strongest among the low-rated smaller debt issues of which banks have underwritten a relatively greater share. They show that bank entry decreased market concentrations. Puri (1996) examines the question: ‘When commercial banks make loans to firms and also underwrite securities, does this hamper or enhances their role as certifiers of firm value?’ She finds that investors are willing to pay higher prices for securities underwritten by banks rather than investment houses.

1.4.3 Literature on Size, Profitability and Diversification Benefits

Size is important for exploiting merger opportunities. For example, Hawawini, and Swary (1990) find that acquirers are significantly larger than targets. Calem (1994) finds that after bank holding company branching reforms, large banks acquired small banks. In addition, Cheng, Gup, and Wall (1989), and Palia (1993) find that larger acquiring firms add more to target bank value.

There is evidence that poorly performing firms become potential targets for mergers. BarNiv and Hathorn (1997) find that timely mergers in the insurance industry serve as an alternative to insolvency in 20% to 46% of the mergers considered in their

study. Similarly Whiting (1997) argues that banking organizations with higher ROEs (Return on Equity) or ROAs (Return on Asset) are more likely to purchase insurers that have lower ROE or ROA. Swary (1986) shows that target banks with higher capital ratios than their bidder banks have greater abnormal returns. Thus, it seems that abolishing cross-industry merger barriers will create wealth effects for poorly performing firms.

The GLBA may create diversification benefits for the financial services industry by removing merger barriers. Wall, Reichert and Mohanty (1993) investigate whether combinations of bank and non-bank firms can reduce a banking organizations' operating risk. They conclude that the best opportunity for diversification gains is for banks to merge with firms engaged in some aspects of the insurance industry. Boyd, Graham and Hewitt (1993), using simulated data, find that bank holding company (BHC) mergers with life and property/casualty insurance companies reduce risk.

1.4.4 Literature on international spillover effects

There is evidence in the literature of international spill over effects that predict that the impact of GLBA will not be limited to the U.S. financial services industry. Bruner and Simms (1987) examine the reaction of the U.S. banks to the Mexico's loan crisis find that the U.S. banks reacts negatively to the news. Musumerci and Sinkey (1990) find that Brazil's announcement of a debt moratorium in 1987 had negative impact on the U.S. money center banks. Madura, Whyte and McDaniel (1991) find that Citicorp's announcement of significant increase in loan-loss reserve in 1987 had a significant negative impact on British banks. In all of the above cases the exposure of banks to the less developed countries are identified as the reason for the negative reactions.

1.4.5 Cross boarder consolidation and risk expected return tradeoffs

The available empirical research suggests that at least some types of cross-boarder consolidation can improve the risk-expected return tradeoffs. The literature on commercial banks in the U.S. generally find that larger, more geographically diversified institutions tend to have better risk expected return tradeoffs (e.g. Macclister and McManus (1993), Hughes, Lang, Mester, and Moon (1996, 1999), Hughes and Mester (1998) and Demsetz and Strahan (1997)), while Cummins and Weiss (2000) find that international diversification can improve risk expected return tradeoff and profit efficiency for insurance industry.

1.4.6 Literature on the determinants of foreign bank presence, activity and growth

Grosse and Goldberg (1991) investigate the foreign banking activity in the United States by their country of origin. Their results show that foreign investment (FDI and foreign portfolio investment) into United States, bilateral trade, size of each country's banking sector (demand deposit and Time deposit) are positively correlated with that country's bank presence in the U.S. Hultman and McGee (1989) find that foreign presence of US bank subsidiaries are directly related to FDI, exchange rate, and inversely related to P/E ratios. They find that the growth of foreign bank branches and agencies in the U.S. is directly related to FDI, exchange rate and the passage of International Banking Act (IBA) of 1978. Goldberg and Saunders (1981) show that important determinants in foreign banks' growth in the US are size of interest differentials between U.S. and foreign deposits and loan, the falling P/E ratio for US bank stocks, increased size of FDI, the persistent depreciation in the dollar and the expectation that the IBA of 1978 would have a restrictive affect on foreign bank activity in the US. Seth et al. (1998)

show that one of the major determinants of financial institutions growth abroad has been the parallel growth of foreign direct investment and foreign trade by globally oriented multinational corporations from the institution's home country.

1.5 Methodology

In this paper we use both market return and balance sheet information of banks to test the above hypotheses. The stock price reaction of regulatory changes is estimated using the *Seemingly Unrelated Regression Model* of Zellner (1962). A similar method is used in other studies³.

We use an extension of the standard market model. Lag values of the market index are used in our model to address the possible nonsynchronous trading effect. We use dummy variables to identify the major events that led to the passage of the GLBA. The dummy variable is equal to 1 over the event window and zero otherwise. The coefficient estimate associated with the dummy variable measures the impact of the event on the portfolio return. We employ the three factors model used in the banking literature⁴.

Schwert (1981) argues that individual asset returns of firms in the same industry measured over a common time period are contemporaneously correlated because the firms will react similarly to any unanticipated event. So, in events such as regulatory changes, the residuals will not be 'iid' (identically and independently distributed). If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, the SUR (Seemingly Unrelated Regression) model estimates will be

³ Schipper and Thompson (1983), Binder (1985a,b, and 1988), Rose (1985), Smith, Bradley and Jarrell (1986), Cornett and Tehranian (1989,1990), Hendershott, Lee and Tompkins (2000).

⁴ Wetmore and Brick (1994) and Choi, Elyasiani and Kopecky (1992)

more efficient than the OLS (Ordinary Least Squares) estimates. Thus, we use SUR to estimate the following models.

1.5.1 Overall Impact of The Regulation

We estimate the following model in order to test for the winners and losers in the banking industry:

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \gamma_i DG_t + e_{it} \quad (1)$$

Here, R_{it} = return on portfolio i ($i=1,2,3$) on day t (T =daily observations from January 1998 to December 2000). Rm_t = Return on CRSP value weighted index at time t . α_i = the intercept coefficient for portfolio i . $\beta_{i1}-\beta_{i3}$ = market risk coefficient for portfolio i . $\beta_{i4}-\beta_{i6}$ = measures the change in the exposure to systematic risk. δ_i = foreign exchange risk coefficient for portfolio i . κ_i = the interest rate risk coefficient for portfolio i . D_t = dummy variable which is equal to 1 in every event window and zero otherwise. e_{it} = the random disturbances. D is a dummy variable that is equal to 1 after the enactment of the regulation (after 11/21/99). DG is a dummy variable that is equal to 1 over every event window and zero otherwise. γ_i captures the average impact of the regulation on portfolio i .

1.5.2 Impact of Individual Events on Portfolios

In order to test for hypotheses surrounding the events we estimate the following model:

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it} \quad (2)$$

Here, D_{kt} is the dummy variable which is equal to one on event window k and zero otherwise, so γ_{ik} captures the average impact of k th announcement on portfolio i .

Following Green (1997), the above model in matrix form can be written as:

$$\begin{bmatrix} \bar{R}_1 \\ \bar{R}_1 \\ \dots \\ \dots \\ \bar{R}_m \end{bmatrix} = \begin{bmatrix} \tilde{X} & 0 & \dots & \dots & 0 \\ 0 & \tilde{X} & \dots & \dots & 0 \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ 0 & 0 & \dots & \dots & \tilde{X} \end{bmatrix} \tilde{\beta} + \begin{bmatrix} \tilde{e}_1 \\ \tilde{e}_2 \\ \dots \\ \dots \\ \tilde{e}_m \end{bmatrix} \quad (3)$$

Here each element of matrix or vector has T observations and \tilde{X} are the regressors i.e. $\alpha, \alpha D, Rm_{t-2}, Rm_{t-1}, Rm_t, Rm_{t-2}*D, Rm_{t-1}*D, Rm_t*D, Rf_t, Rr_t, D_{kt}$. Let

$$\varepsilon = [\tilde{e}'_1 \quad \tilde{e}'_2 \quad \dots \quad \dots \quad \tilde{e}'_m] \quad (4)$$

The assumption regarding the error term is:

$$E[\varepsilon] = 0$$

$$E[\varepsilon \varepsilon'] = 0$$

$$E[e_{it}e_{js}'] = \sigma_{ij}, \text{ if } t=s \text{ and } 0 \text{ otherwise.}$$

The disturbance formulation is therefore,

$$E[e_t e_j'] = \sigma_{ij} I_T$$

$$E[\varepsilon \varepsilon'] = V = \begin{bmatrix} \sigma_{11} I_T & \sigma_{12} I_T & \dots & \dots & \sigma_{1m} I_T \\ \sigma_{21} I_T & \sigma_{22} I_T & \dots & \dots & \sigma_{2m} I_T \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ \sigma_{m1} I_T & \sigma_{m2} I_T & \dots & \dots & \sigma_{mm} I_T \end{bmatrix} \quad (5)$$

Now Let,

$$\Sigma = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \dots & \dots & \sigma_{1m} \\ \sigma_{21} & \sigma_{22} & \dots & \dots & \sigma_{2m} \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ \sigma_{m1} & \sigma_{m2} & \dots & \dots & \sigma_{mm} \end{bmatrix} \quad (6)$$

Substituting Σ in equation 5 we get,

$$V = \Sigma \otimes I$$

$$V^{-1} = \Sigma^{-1} \otimes I \quad (7)$$

So the GLS (Generalized Least Squares) estimator of SUR is,

$$\hat{\beta} = [X'V^{-1}X]^{-1}X'V^{-1}R = [X'(\Sigma^{-1} \otimes I)X]^{-1}X'(\Sigma^{-1} \otimes I)R \quad (8)$$

1.5.3 Specification test

We present a simple specification test to verify our extended model. Specification tests in this case involve testing for correlation across portfolios; this is the same as testing the hypothesis that the off-diagonal elements of Σ (variance-covariance matrix) are zero. There are two such specification tests in the literature: the Likelihood Ratio (LR) test and the Lagrange Multiplier (LM) test. The statistics in both cases are χ^2 distributed. Berndt and Savin (1977) demonstrate that the following inequality holds:

$$LM \leq LR$$

between these statistics. Since we have the same asymptotic distribution, the LM test rejects the null hypothesis less often than the LR test. We will use the LR test to check for the diagonality of the variance-covariance matrix. Excluding the diagonal elements, there are $1/2m*(m-1)$ unknown parameters in Σ and these can be arranged in vector θ . The null hypothesis that we will test is:

$$H: \theta = 0$$

This test is based on the following statistics

$$\lambda_{LR} = T \left[\sum_{i=1}^m \log \hat{\sigma}_i^2 - \log |\hat{\Sigma}| \right] \quad (9)$$

where $\hat{\sigma}_i^2$ is $e_i' e_i / T$ from the individual least squares regressions and $\hat{\Sigma}$ is the maximum likelihood estimator Σ . This statistic has a limiting χ^2 distribution with $1/2m*(m-1)$ degrees of freedom under the null hypothesis.

1.6 Data Preparation and Event Selection

1.6.1 Firm Selection

For the first two chapters I use the SIC classification from COMPUSTAT (Research Insight) to identify the commercial banks (SIC 6021 and 6022) and insurance companies (Life insurance. (SIC 6311), Property/Casualty insurance (SIC 6331), Other types of insurance (SIC 6321, 6351 6361) to create our portfolios. The return information for this study comes from the CRSP tape, while the balance sheet information comes from COMPUSTAT. We require these firms to have no missing trading data for at least 3 years, over the period January 1998 to December 2000. In order to match firms from COMPUSTAT and CRSP we omitted all firms with exchange codes 4 to 10, since CRSP only has return information of firms traded either on the NYSE, AMEX or NASDAQ. We required the firms to have balance sheet information from 1997 to 1999. We use return information of the sample firms from January 1998 to December 2000 to estimate each of our models.

For the third paper I use daily common stock return data over a period from January 1998 to December 2000. Daily stock return and the balance sheet information for large banks from Canada, Denmark, France, Germany, Greece, Italy, Japan, Spain,

Switzerland, and the UK are obtained from DataStream database and BankScope database. The total sample consists of 215 international banks and 45 large U.S. banks (over 10 billion dollar total asset in 1998). Return information for the U.S. companies are obtained from CRSP database.

For the fourth paper I use daily common stock return data over a period from January 1998 to December 2000. Daily stock return and balance sheet information for major insurance companies from Austria, Canada, France, Germany, Greece, Ireland, Italy, Japan, Spain, Switzerland, and the UK are obtained from Datastream database. The total sample consists of 83 foreign insurance companies and 31 major U.S. insurance firms. Return information for the U.S. companies are obtained from CRSP database.

1.6.2 Macro Financial Variables

Data for the two macro-economic variables used in our study is obtained from the Board of Governors of the Federal Reserve System⁵. For foreign exchange we used the Major Country Index⁶ from the Board of Governors of the Federal Reserve System. The return is calculated using the following formula⁷:

$$Rf_t = \frac{F_t - F_{t-1}}{F_{t-1}} \quad (10)$$

⁵ All the information is available online from <http://www.federalreserve.gov>

⁶ The major currencies index is a weighted average of the foreign exchange values of the U.S. dollar against a subset of currencies in the broad index that circulate widely outside the country of issue. The weights are derived from those in the broad index.

⁷ Same as that used by Wetmore and Brick (1994).

Here, F_t is the value of the Major Country Index at time t . To be consistent with the literature,⁸ we use the one-year T-bill rate as a proxy for the interest rate. Interest rate returns are computed using the following formula⁹:

$$Rr_t = \frac{R_t - R_{t-1}}{R_{t-1}} \quad (11)$$

Here, R_t is the interest rate on one year t-bill at time t . Actual returns are used because there is no difference in the results regardless of whether interest rates are anticipated¹⁰; also, we do not orthogonalize the indices¹¹.

1.6.3 Selected Events and Expected Industry Reaction to the Events

We analyze all the major events in the passage of GLBA. We include in our analysis events that have “material change” as defined by Schipper and Thompson (1983). In total there are 13 different events that we investigate between November 1998 and November 1999. We identify these events from the Wall Street Journal and Lexis-Nexis wire service. Table 1 specifies these events and event dates.

The first event is news of Senator Alfonse D’Amato’s loss of his New York re-election on November 3, 1998 and the news of Senator Gramm’s succession to Senate Banking Committee chair on November 4, 1998. This event is important for the banking industry because Senator Gramm favored the banking industry throughout the 1998 session, when the bill was discussed in the Senate. It is clear that if he becomes the chair

⁸ Kane and Unal (1998), Flannery and James (1984), and Wetmore and Brick (1994).

⁹ Same as that used by Wetmore and Brick (1994).

¹⁰ Flannery and James (1984).

¹¹ Giliberto (1985) argues that orthogonalizing the indices results in biased estimators. Moreover not apparent which index is the driving index and which is the driven one., Kane and Unal (1998) argue that it is

of the Senate Banking Committee any proposed act is likely to go more in favor of the banking industry.

Table 1: Time line of the Gramm-Leach-Bliley Act.

Note: The first column 'Date' is the event date. If the event occurred after the trading closed for a day then that the next trading day is the event date. Event Window is defined as Event Date, -1 day and +1 day. The second column 'Event' describes the main event.

Date	Event
11/4/98	1. (i) Senator Alfonse D'Amato lost his re-election bid (11/03/98 –night). (ii) Senator Gramm to take over as a chair of Senate Banking Committee. (11/04/98).
1/8/99	2. Financial Services Reform Bill is reintroduced in Congress.
2/17/99	3. Draft bill was unveiled in the Senate.
4/12/99	4. Senator Gramm meets with Senate Minority leader to work on the bill.
4/28/99	5. Senate Banking Committee formally files the Financial Services Modernization Act in the Senate.
5/4/99	6. Clinton raises the privacy issue to be included in the bill.
05/06/99 – Midnight	7. Senate passes S. 900. Senate version of the Bill is passed.
7/1/99	8. House version of the bill was passed.
10/15/99	9. Federal Reserve and Treasury announce agreement on the regulation.
10/22/99	10. Gramm makes deal with White House on CRA.
11/02/99	11. Joint House Conference report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.
11/4/99	12. Senate passes the bill (90-8) and House passes the bill (362-57).
11/12/99	13. President Clinton signs the bill into law.

As a result we expect the banking industry to have a positive price reaction to this news. The Financial Services Reform Bill is introduced in congress on January 8, 1999; this is our second event. A similar bill has been blocked in the Senate over the Community Reinvestment Act (CRA) issue; we expect a moderate reaction to this event.

The third event on our list is the unveiling of the draft bill in the Senate on February 17, 1999. At this time the FED and Treasury are divided between who should have ultimate control over the banking industry (OCC or FED) and what should be the structure under which banks should diversify; i.e., should it be a Bank Holding Company (BHC) structure or should the banks diversify using subsidiaries. After three days of hearings, most of the legislators are in favor of giving overall control to the FED and BHC structure (this became known as the FED's view of modernization). This structure is more in favor of the banking industry because they have already been successful in the BHC structure, so we expect a positive reaction for the banking industry. The insurance industry may have a positive reaction to this announcement because it opens the opportunity for bank-insurance mergers that would not have been available if the other structure of bank operation diversification were accepted. The fourth major event is the news of Senator Gramm's meeting with the Senate minority leader on April 4, 1999. Senator Gramm and Senator Sarbanes (a ranking member of Senate Banking Committee) have a difference in opinion over the CRA issue. This event may have a positive impact on banking industry. On April 28, 1999, the Senate Banking Committee formally files the Financial Services Modernization Act in the Senate. We expect moderate reaction for banking industry on this event, because this version of the bill favors banks. On May 4, 1999, President Clinton suggests that the privacy protection provision for consumers should be included in the bill. The basic principal of his proposal is that people should have the right to decide whether information about them, held by banks, insurance firms or securities companies, should be shared or sold. We expect this event to have a negative impact on all the sectors because; if this provision is included into the bill, then

it will restrict the scope economies for all sectors. The seventh event is the Senate passing the S. 900 (Senate version of the bill) on May 6, 1999. This version includes the privacy provision. This bill has been discussed in the Senate for a long time, so there are no surprises in this bill; we expect moderate or no reaction on this event. The next major event (eighth event) is the passing of the House version of the bill on July 1, 1999. This bill may create negative reactions because the consumer privacy protection provision included in this bill is even stronger than that of the Senate version of the bill. The FED and Treasury agree upon the structure of regulation on October 15, 1999. Since the negotiations between them have been going on for some time before this announcement, we expect moderate or no reaction to this announcement. On October 22, 1999, Senate Banking Committee Chair Senator Gramm agrees with the White House, that one version of the CRA that will be included in the bill. The version of CRA provision that is included in the bill is more relaxed than the 1977 version of the bill; now banks will be subject to CRA scrutiny once every four years instead of 18 months to three years. So we expect positive moderate or no reaction on the part of banks. But we expect a significantly positive reaction from insurance and securities firms because this announcement removes major obstacles to the passage of the Financial Services Modernization Act. A Joint House conference report signed by the majority of the members on November 2, 1999 is our eleventh event. We expect moderate or no reaction on this event across the industry. On November 4, 1999, the Senate and the House passed the Financial Services Modernization bill. All the provisions that go into this bill are already known so it may not have any reaction. The final event that we analyze is the occasion of the President's signature of the bill on November 12, 1999. We expect major

gains in stock price for the whole industry on this event, mainly because this law has been in limbo for a long time;¹² finally passing of this overdue bill is great news for the whole industry.

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¹² There have been three major attempts to pass this law. The first time in 1995, Representative Jim Leach introduced the banking modernization bill. The second time, the financial modernization bill died in congress due to strong opposition from the insurance industry. And finally, in 1998 the House version of the modernization bill passed but died in the Senate.

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Chapter II

The Wealth and Risk Effects of Gramm-Leach-Bliley Act (GLBA) on the U.S. Banking Industry

2.1 Abstract

The Gramm-Leach-Bliley Act (GLBA) of 1999 marks the end of Depression era regulations like the Glass-Steagall Act of 1933 and Bank Holding Company Act of 1956. These acts have restricted banks from securities and insurance underwriting business. This paper examines the impact of the GLBA on the banking industry. We find that the banking industry has a welfare gain from this law. We investigate two different categorizations of the banking industry. We find that Money Center banks followed by the Super Regional banks benefited most from this deregulation. On the other hand, banks that had Section 20 investments subsidiaries gained more than other banks in the second category. The results also show that the exposure to systematic risk for different categories of banks decreased after the passage of this law, which implies that the GLBA is fairly successful in containing the risk that accompanied the act and also created diversification opportunities. For Money Center banks, Super Regional Banks, banks with a section 20 subsidiary and banks with a new financial subsidiary, a shift in the exposure to systematic risk can explain the overall cross sectional variation in return from the deregulation. In both categorizations we find that larger banks gained more, while the overall explanatory power of profitability is not conclusive.

2.2 *Introduction*

The Gramm-Leach-Bliley Act (GLBA) of 1999 (also known as Financial Services Modernization Act) starts a new era for the financial services industry in the U.S.A. This law marks the end of depression era laws: Glass-Steagall (1933) and Bank Holding Company Act (1956). The Glass-Steagall Act separated commercial banks and investment banks. The Bank Holding Company Act separated commercial banks from insurance underwriting. The modernization of the US financial services industry began in 1983 when the Federal Reserve allowed Bank Holding Companies (BHC) to acquire discount security brokers. The GLBA is the final piece of legislation that repealed depression era laws and allows one line of business to enter or merge with another line of business.

What will be the impact of the law on the banking industry? Some argue that the impact will be phenomenal¹; others argue it will only be marginal². However, if there is any change in expected economic profit it should immediately be reflected in the stock price of firms in that industry³. Our focus in this study is the impact of the GLBA on the Banking Industry. Hogan (2001) argues that this law is “in its essence banking industry legislation.” Akhigbe and Whyte (2001) find that the announcements that lead to the passage of the GLBA create positive wealth effects for the banking industry. Herdershott, Lee and Tompkins (2000), on the other hand, find no significant impact on the banking industry. Both, however, find that larger banks gain more than smaller ones.

¹ John D. Hogan, 2001.

² Barth, Brumbaugh and Wilcox, 2000.

³ Fama and MacBeth (1973).

The GLBA allows banks, brokerage and the insurance companies to merge. In addition, newly created Financial Holding Companies (FHC) may engage in a wide range of activities, including insurance underwriting, securities activity, merchant banking, and real state development. Banks can extend insurance and securities activity using a new type of subsidiary known as a Financial Subsidiary (FS). We examine the impact of this landmark legislation on the banking industry. Specifically we evaluate empirically: a. how the market values of the banking industry change at the time of various announcements during the passage of the GLBA; b. whether the bank's expertise and prior access to securities activities through Section 20 subsidiaries give this industry an edge in competition in a more integrated financial services industry; c. how the risk behavior of the banking industry change in response to the passage of the GLBA; d. what important characteristics of the banking industry cause increases in their market values resulting from the passage of the GLBA; e. whether the "too big to fail" doctrine applies to the banking industry due to the passage of the GLBA.

Several studies have investigated the GLBA. Barth, Brumbaugh and Wilcox (2000) investigate the major provisions of the act. They argue that the act is ratifying the "Status-Quo"⁴ rather than being revolutionary, and that this act favors big banks ('broad banking companies'). Akhigbe and Whyte (2001) examine the events leading up to and the passage of the Financial Services Modernization Act on the stock returns of banks, brokerage firms, and insurance companies. They find that the impact is positive for all institutions. Bank gains are positively related to size and capitalization. Brokerage firms and insurance companies gain regardless of their size. Insurance firms gain regardless of

⁴ They said, "ratifying and extending changes that had already being made, rather than as revolutionary".

their capital position, but brokerage firms' gains are inversely related to their capital position. Carow and Heron (2002), on the other hand, find that investment and insurance companies benefit from the GLBA and that banks do not benefit. They also find negative returns for foreign banks, thrifts and finance companies. Larger non-depository firms have higher returns from this law.

There are several studies that look at the major deregulations leading up to the Gramm-Leach-Bliley Act. Cornett, Ors and Tehranian (2002) examine the performance of commercial banks around the establishment of a Section 20 subsidiary. They find that Section 20 activities undertaken by commercial banks result in increased industry-adjusted operating cash flow return on assets, due mainly to revenues from non-commercial banking activities. The initial alliances of commercial banks and investment banks via the establishment of Section 20 subsidiaries have been beneficial to commercial bank performance, and allowed commercial banks to diversify their activities with increased performance relative to the risk being undertaken. Cyree (2000) also finds similar results for increased investment banking powers for commercial banks, when the revenue limit for investment subsidiaries increased from 10% to 25%. He also finds that the larger banks benefit more than smaller banks. Ely and Robinson (1998) analyze the wealth effect on banking and security firms in the event of an increase in the revenue limit on bank security subsidiaries from 10% to 25%. They tried to predict the impact the repeal of the Glass-Steagall Act would have on these two industries. They find that the expansion has a positive wealth effect around the announcement for most of the individual investment banks. This study also finds that this expansion has a positive wealth effect for the banks, especially for the firms that already have a security

subsidiary. Boyd, Graham and Hewitt (1993) investigate the effect of bank holding company (BHC) mergers with non-bank financial firms using simulated data and find that BHC mergers with life and property/casualty insurance companies reduced risk. Irrespective of using market or accounting data they reach the same conclusion. Gande, Puri and Saunders (1999) examine the competitive effects of commercial bank entry into the corporate debt underwriting market. They find that the underwriting spread and ex-ante yields have declined significantly with bank entry. The effect is strongest among the low-rated smaller debt issues of which banks have underwritten a relatively greater share. They show that bank entry decreased market concentrations. Puri (1996) examines the question of when commercial banks make loans to firms and also underwrite securities, does this hamper or enhance their role as certifiers of firm value? She finds that investors are willing to pay higher prices for securities underwritten by banks rather than investment houses.

Our study improves upon previous studies in a number of ways. First, we examine the banking industry thoroughly as the GLBA is expected to impact the banking industry the most. Officially, the GLBA rule-making powers are split between the Federal Reserve (FED) and the Treasury, but the FED, the Treasury, and the Comptroller of the Currency (OCC) share general oversight duties. The tug of wars among the three regulatory authorities and the banking lobby has injected uncertainty into the financial services industry, the resolution of which may depend on protracted negotiations between regulators and Congress. The banking lobby, for example, frustrated by the conservative regulatory rulings, has tried to persuade Congress to reconsider the GLBA and enforce a

more liberal interpretation.⁵ We expect BHCs with Section 20 subsidiaries to experience increases in market value mainly due to the dominance of first-mover advantage effects, “too big to fail” guarantee effects, and possibly positive acquirer effects similar to those documented by Kane (2000). Indeed, Kane (2000) shows that giant U.S. banking organizations gain value from becoming larger. Our results show that banks with prior Section 20 subsidiaries that converted into a FHC benefited the most from the GLBA. Therefore, the banking industry in a way has internalized the potential uncertainty created by the regulatory dialectic by adjusting their organizational structure.

Second, the GLBA is expected to benefit the financial services industry by promoting financial innovations, lowering capital costs and increasing international competitiveness. The real question is whether defacto deregulation has made the Glass-Steagall Act effectively redundant or not. Those who argue that there will be no impact from the repeal of the Glass-Steagall Act state that, prior to enactment of the GLBA, the financial services industry had discovered many ways to circumvent their barriers, and the impact of which has already been impounded in the stock prices. In addition, they argue that the anticipation of the GLBA may have initiated many developments, such as the merger between Citicorp and Travelers in April 1998, possibly signaling that regulators would allow similar types of mergers in the future. However, we argue that events leading to the passage of the GLBA should have significant impact on the banking industry. The GLBA provides more flexibility for cross-industry mergers than existed prior to its passage. Moreover, the twenty years battle of enacting this legislation hung in

⁵ Schmitt (2001); Gensler (2000); Meyer (2000); Leach (2000).

the balance until the very end, and its passage removed uncertainty regarding the regulatory framework that will govern the future evolution of the financial industry.

Third, it has been argued that positive wealth effects accrue to banks that are believed to be “too big to fail”. The GLBA allows large banks to expand further to enhance their “too big too fail” guarantee. In order to examine differential impacts on different segments of the banking industry, we divide our sample into Money Center Banks, Super Regional Banks, and other banks. We also investigate firm specific characteristics to test whether bigger banks gain more on various events leading to the passage of the GLBA.

Finally, consolidation that is expected to result from the repeal of the Glass-Steagall Act may reduce the number of firms in the financial services industry, but at the same time, might create more competition for insurance and securities firms and threaten their future profitability. The regulatory concern is to what extent the GLBA might increase the risk of the U.S. financial industry. We argue that the banking industry reduces their risk by diversifying their activities in the securities and insurance business. We find that the passage of the GLBA reduces the systematic risk of the banking industry. This result is important for the regulator’s policy making and shareholders’ investment decisions.

The rest of the study is organized as follows: the first section provides historical overview, describes the relevant parts of the law that might affect the banking industry in brief. Section two describes the major deregulations that came before the GLBA, the GLBA and introduces the major hypotheses. Section three describes the methodology; section four describes the data and lists the major events. Section five presents the

empirical results. Section six describes the cross-sectional analysis and the final section concludes.

2.3 Law and Hypotheses

2.3.1 The Law⁶

The centerpiece created by the GLB is the Financial Holding Company (FHC). BHCs and foreign banks that meet certain criteria can become a FHC. All depository institutions must be well managed and well capitalized to become a FHC. If the FHC or foreign bank fails to meet any such standards after they became FHC, they have 180 days to correct it or the Federal Reserve (FED) may order the company to divest or terminate its financial activities or depository subsidiaries. No declaration to become FHC is effective under the GLBA unless each of its depository subsidiaries has at least a satisfactory or better rating under the Community Reinvestment Act (CRA). If any of the FHC's depository subsidiaries falls short of a satisfactory CRA rating, the FED may ask the company not to acquire any other company or get involved in any additional financial activity. The act authorizes the FHCs to engage in a wider range of activity under the extended power granted by the GLBA. These activities may be financial in nature like securities underwriting and dealing, insurance agency and underwriting activities, and merchant banking activities. The FED may also allow additional activities after consultation with the Secretary of the Treasury (it may be non-financial activity complementary to financial activity as long as it does not pose substantial risk to the depository institute). The FHC does not need prior permission from the FED to acquire a financial company, but it has to notify the FED within 30 days of doing such.

⁶ Most of the information comes from 'Overview of the Gramm-Leach-Bliley' from the Federal Reserve

The GLBA authorizes extended powers to banks. Well-capitalized banks can underwrite and deal in municipal revenue bonds. Financial subsidiaries of a national bank may engage in activities that are not permitted of national banks. However, a financial subsidiary of the national bank may not engage as a principal in underwriting insurance, providing or issuing annuities, engaging in real estate development or investment, merchant banking or complementary activities that are allowed to affiliates of the FHC. Under the new law, national banks may continue to engage in insurance activities from a place with a population of five thousand or less. National banks are also required to have prior OCC permission to conduct activities through the financial subsidiary. State member banks can own or control a subsidiary engaging in all the activities allowed to the financial subsidiary of a national bank conditional on compliance with the same regulations as national banks. State banks may also engage as principals in activities not allowed to national banks conditional on the approval of the FDIC.

The FED is going to serve as the overall supervisor of the FHCs and traditional regulators will oversee their business activities (banking, investment and insurance). The act contains several new regulations concerning the privacy of customer financial information. The GLBA requires the financial institution to provide the potential customer with their policies and practices regarding the collection and disclosure of non-public personal information to their affiliates and third parties. They are also required to update the customers regarding their policy at least annually. The act prohibits the disclosure of non-public private information to a non-affiliated third party without the approval of the customer and affords the customer the option to opt out from any such

agreement. Financial institutions are generally prohibited under the law from disclosing non-public private consumer information to third party marketing programs, including telemarketing and direct mail programs.

Under the act, any insured depository institution with \$250 million or more in aggregate assets would be subject to a routine CRA examination. An institution will be examined for compliance with the CRA once every 5 years if it is given an ‘outstanding’ rating in the most recent CRA examination and once every four years if it is given a ‘satisfactory’ rating. Any institution that comes under the jurisdiction of the CRA must submit a report to the federal agency concerning the use of CRA related money and resources during the previous year.

2.3.2 Hypotheses

We formulate the following hypotheses regarding the impact of the GLBA on the Banking industry.

Hypothesis 1: *The Banking industry benefits from the GLBA.*

It is argued that regulations destroy value while deregulation creates value. Benston (1996) and Rajan (1996) have shown that the Glass-Steagall Act had limited financial institutions’ ability to pursue economies of scope, thereby destroying value. For banks, scope economies are the most likely source of profitability. For example, a bank can reuse information for which it has already paid a certain fixed cost across a range of financial services where the bank decides to extend their business. Banks can also use their existing technology, personnel and delivery channels to distribute securities and insurance products with their traditional activities at relatively low marginal cost. A part of these economies may come from overhead in administration, back office information

and information technologies over a wider base of financial services. On the other hand, Saunders and Smirlock (1987) note that bank customers provide a natural customer base for brokerage firms. Synergies may also arise, as many consumers may prefer to obtain all their financial services needs from a single firm rather than from several different firms, as Herring and Santomero (1990) argue. Studies⁷ have found that deregulations that allowed product line diversification contributed toward increased revenue and overall risk adjusted performance enhancement for banks. So, the GLBA opens window of opportunity for banks and should thereby benefit the industry.

Hypothesis 2: *Money Center Banks and Super Regional Banks gain more from the GLBA.*

Deregulation will certainly put banks into situations where they will have cheaper diversification opportunities. A broad banking firm may have lower profit variances compared to a bank with traditional banking operations. Broad banking firms like Money Center Banks and Super Regional Banks will be affected less when firms bypass banks and raise capital directly from the capital market, because any decline in lending activity will be offset by securities activity. Cyree (2000) shows that large banks are more benefited than smaller banks to deregulations that eased bank involvement in the securities business. Puri (1996), in addition, finds that investors are willing to pay higher prices for securities underwritten by banks rather than investment houses. Thus, banks certainly have an edge in the securities business and big banks are the best positioned to harness the benefit.

⁷ Cornett, Ors and Tehranian (2002), Cyree (2000).

On the other hand, 50% to 65% (depending on the method of calculation) of all banking organizations in the U.S.A. sell insurance products of one kind or another⁸. Money Center Banks and Super Regional Banks now have the opportunity to enter the insurance underwriting business more aggressively than before, as the GLBA will allow banks to merge with or acquire insurance businesses. Only with these banks we expect to see a full line of insurance operations. Akhigbe and Whyte (2001) similarly argue that “....benefits are more likely to accrue to large, Money Center Banks that are better positioned to capitalize on the new opportunities.”

Hypothesis 3: *Banks that had Section 20 subsidiaries benefit more than banks that did not have such subsidiaries.*

Puri (1996) argues that people are willing to pay a premium for corporate debts underwritten by banks over those underwritten by the investment houses. Under the GLBA the revenue limit for the investment subsidiary of the banking firms increases from the pre-act 25% to 45% of the consolidated entity. The financial subsidiaries of the national banks can get involved in activities that are ‘financial in nature or incidental to financial activity’, but they are prohibited from insurance underwriting and annuity issuance. Under section 92 of the National Banking Act, national banks are permitted to conduct insurance agency activities in offices of national banks located in a place of less than five thousand people. Since the subsidiary of the national banks are not subject to this geographical constraint, we expect that national banks transfer their insurance agency activity to their financial subsidiary.

⁸ LaRocco, Larry, 1999.

The revenue limit increase would certainly mean an increased income opportunity for banks and a way of stabilizing the variance of the revenue. Banks that already had experience of how to go about non-traditional banking activity will be more benefited from this law. Thus, we expect that banks that had Section 20 subsidiaries will gain more.

Hypothesis 4: *The GLBA reduces exposure to systematic risk across the banking industry.*

The GLBA may create diversification benefits for the financial services industry by removing merger barriers. Wall, Reichert and Mohanty (1993) investigate whether combinations of bank and non-bank firms can reduce a bank's operating risk and conclude that the best opportunity for diversification gains is for bank to merge with firms engaged in some aspects of the insurance industry. Boyd, Graham and Hewitt (1993), using simulated data, find bank holding company (BHC) mergers with life and property/causality insurance companies reduce risk (systematic).

The GLBA also reduces risk by providing safeguards against excessive risk taking. Under the GLBA certain activities are forbidden, while other activities are restricted to the subsidiaries. The GLBA establishes financial health criteria for expanding business into other sectors, assigns the FED the responsibilities of FHC supervision and regulation and gives the FED access to risk data across the entire organization.⁹ The GLBA has provisions to use market signals to discipline institutions. The GLBA also emphasized on market based measures to contain excessive risk taking behavior. For example it assigns the FED studies of the feasibility and appropriateness of requiring large banks to issue subordinated debt that will be rated by major rating agency.

⁹ Feldman, Lyon and Willardson (2000) summarize legal aspects of the FSMA.

If these bond ratings falls below investment grade then new expansion projects cannot be undertaken.

The merger opportunity created by the GLBA will benefit some lines of insurance business more than others. Johnston and Madura (2000) points out that banks will be interested in the cross selling of insurance products that complement banking products; for example, mortgage and mortgage insurance, auto financing and auto insurance. Saunders and Walter (1994), on the other hand, conclude that greater synergistic gains are available for a combination of banks and life insurers than from combinations of banks and property/causality insurers.

Hypothesis 5: *The GLBA is more favorable towards larger banks.*

Size is regarded as an important factor in the financial institution literature. Barth et al (2000) and Akhigbe and Whyte (2001) argue that the GLBA benefit larger banking institutions. We argue that even after controlling for all industry specific characteristics the big firms will be the biggest beneficiaries of this law.

2.4 Methodology

In this paper we use both market return and balance sheet information of banks to test the above hypotheses. The stock price reaction of regulatory changes is estimated using the *Seemingly Unrelated Regression Model* of Zellner (1962). A similar method is used in other studies¹⁰.

¹⁰ Schipper and Thompson (1983), Binder (1985a,b, and 1988), Rose (1985), Smith, Bradley and Jarrell (1986), Cornett and Tehranian (1989,1990), Hendershott, Lee and Tompkins (2000).

Table 1: Money Center Banks and Super Regional Banks *

Money Center Banks	Super Regional Banks
BankAmerica	BankBoston Corp
Bank One Corp.	Bank of New York Co.
Bankers Trust	First Union Corp
Chase Manhattan	Republic NY Corp
Citigroup	State Street Corp
J.P. Morgan	

*Source: Federal Financial Institutions Examination Council (FFIEC) in its quarterly statistical release December 31, 1998.

We use two different sets of portfolios to test our first five hypotheses. The first set of portfolios includes Money Center Banks, Super Regional Banks¹¹ (a list of these banks are presented in table 1) and other banks that meet our sampling criterion. The second set of portfolios consists of banks that had a Section 20 subsidiary prior to the GLBA and banks that now have a financial subsidiary but did not before the GLBA. The list of banks with a Section 20 subsidiary and banks that now have a financial subsidiary are presented in table 2. All the information about the banks with a Section 20 subsidiary and banks that now have a new Financial Subsidiary are obtained from the Federal Reserve Bulletins and web site.

We use an extension of the standard market model. Lag values of the market index are used in our model to address the possible nonsynchronous trading effect. We use dummy variables to identify the major events that led to the passage of the GLBA. The dummy variable is equal to 1 over the event window and zero otherwise. The

¹¹ The Federal Financial Institutions Examination Council (FFIEC) in its quarterly statistical release publishes the name of Money Center Banks and Other large banks (which is used in the literature as Super regional Banks). In this study we use the banks categorized as Money Center Banks and Super Regional Banks as of December 31, 1998 in FFIEC statistical release. This is presented in table 1.

coefficient estimate associated with the dummy variable measures the impact of the event on the portfolio return. We use the three factors model used in the banking literature¹².

Table 2: Banks with a Section 20 subsidiary and banks that now have a Financial Subsidiary but never had a Section 20 subsidiary.

Banks that had Section 20 subsidiary before the GLBA	Banks that never had Section 20 subsidiary but now have Financial Subsidiary
MARINE MIDLAND BKS INC	CULLEN/FROST BANKERS, INC.
SOVRAN FINANCIAL CORP	FIFTH THIRD BANCORP
MANUFACTURERS HANOVER CORP	FIRST SECURITY BANCORP
SECURITY PACIFIC CORP	FIRST STATE BANCSHARES, INC.
LIBERTY NATIONAL BANCORP INC	HIBERNIA CORPORATION
FIRST CHICAGO CORP	INTERNATIONAL BANCSHARES CORP.
BANK SOUTH CORP	NBT BANCORP INC.
FIRST INTERSTATE BANCORP	REGIONS FINANCIAL CORP.
DAUPHIN DEPOSIT CORP	SOUTHTRUST CORPORATION
BARNETT BANKS INC	STATE STREET CORPORATION
FIRST OF AMERICA BANK CORP	U.S. BANCORP
CORESTATES FINANCIAL CORP	UMPQUA HOLDINGS CORPORATION
BANKAMERICA CORP	WACHOVIA CORPORATION
CRESTAR FINANCIAL CORP	WELLS FARGO & COMPANY
BANKERS TRUST CORP	
BANKBOSTON CORP	
REPUBLIC NEW YORK CORP	
B B & T CORP	
B O K FINANCIAL CORP	
BANK NEW YORK INC	
BANK ONE CORP	
CHASE MANHATTAN CORP NEW	
CHEMICAL FINANCIAL CORP	
CITIGROUP INC	
COMMERCE BANCORP INC NJ	
FIRST UNION CORP	
FLEETBOSTON FINANCIAL CORP	
HUNTINGTON BANCSHARES INC	
KEYCORP NEW	
MELLON FINANCIAL CORP	
MORGAN J P & CO INC	
NATIONAL CITY CORP	
P N C FINANCIAL SERVICES GRP INC	
SUNTRUST BANKS INC	
SYNOVUS FINANCIAL CORP	

Source: *Federal Reserve*, December 1999.

¹² Wetmore and Brick (1994) and Choi, Elyasiani and Kopecky (1992)

Schwert (1981) argues that individual asset returns of firms in the same industry measured over a common time period are contemporaneously correlated because the firms will react similarly to any unanticipated event. So, in events such as regulatory changes, the residuals will not be ‘iid’ (identically and independently distributed). If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, the SUR (Seemingly Unrelated Regression) model estimates will be more efficient than the OLS (Ordinary Least Squares) estimates. Thus, we use the SUR to estimate the following models.

2.4.1 Overall Impact of the Law

We estimate the following model in order to test for the winners and losers in the banking industry.

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \gamma_i DG_t + e_{it} \quad (1)$$

Here, R_{it} = return on portfolio i ($i=1,2,3$) on day t ($T=2780$ daily observations from January 1990 to December 2000). Rm_t = Return on CRSP value weighted index at time t . α_i = the intercept coefficient for portfolio i . $\beta_{i1}-\beta_{i3}$ = market risk coefficient for portfolio i . $\beta_{i4}-\beta_{i6}$ = measures the change in the exposure to systematic risk. δ_i = foreign exchange risk coefficient for portfolio i . κ_i = the interest rate risk coefficient for portfolio i . D_t = dummy variable which is equal to 1 in every event window and zero otherwise. e_{it} = the random disturbances. D is a dummy variable that is equal to 1 after the enactment of the regulation (after 11/21/99). DG is a dummy variable that is equal to 1 over every event

window and zero otherwise. γ_i captures the average impact of the regulation on portfolio i .

2.4.2 *Impact of Individual Events on Portfolios*

In order to test for hypotheses surrounding the events we estimate the following model.

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it} \quad (2)$$

Here, D_{kt} is the dummy variable which is equal to one on event window k and zero otherwise, so γ_{ik} captures the average impact of k th announcement on portfolio i .

2.4.3 *Specification test*

We present a simple specification test to verify our extended model. Specification tests in this case involve testing for correlation across portfolios; this is the same as testing the hypothesis that the off-diagonal elements of Σ (variance-covariance matrix) are zero. There are two such specification tests in the literature, the Likelihood Ratio (LR) test and the Lagrange Multiplier (LM) test. The statistics in both cases are χ^2 distributed. Berndt and Savin (1977) demonstrate that the following inequality holds:

$$LM \leq LR \quad (3)$$

between these statistics. Since we have the same asymptotic distribution, the LM test rejects less often than the LR test. We will use the LR test to check for the diagonality of the variance-covariance matrix. Excluding the diagonal elements, there are

$1/2m*(m-1)$ unknown parameters in Σ and these can be arranged in vector θ . The null hypothesis that we will test is:

$$H: \theta = 0 \quad (4)$$

This test is based on the following statistics

$$\lambda_{LR} = T[\sum_{i=1}^m \log \hat{\sigma}_i^2 - \log |\hat{\Sigma}|] \quad (5)$$

where $\hat{\sigma}_i^2$ is $e_i'e_i/T$ from the individual least squares regressions and $\hat{\Sigma}$ is the maximum likelihood estimator Σ . This statistic has a limiting χ^2 distribution with $1/2m*(m-1)$ degrees of freedom under the null hypothesis.

2.4.4 Testable Hypotheses

In addition to the major hypotheses that are presented in the previous section, we also test for the following hypotheses based on the portfolio model. They are¹³:

Hypothesis 6: $\gamma_{1k} = \gamma_{2k} = \gamma_{3k}$ (i.e. abnormal returns for each portfolio is jointly equal on each event window k .)

Hypothesis 7: $\gamma_{i1} = \gamma_{i2} = \dots = \gamma_{i13}$ (i.e. all abnormal returns for each portfolio i are jointly equal).

2.5 Data and Event Selection

2.5.1 Firm Selection

We use the SIC classification from COMPUSTAT (Research Insight) to identify the commercial banks (SIC 6021 and 6022) to create our portfolios. The return information for this study comes from the CRSP tape, while the balance sheet

information comes from COMPUSTAT. We require these firms to have no missing trading for at least 3 years, from January 1998 to December 2000. In order to match firms from COMPUSTAT and CRSP we omitted all firms with exchange codes 4 to 10, since CRSP only has return information of firms traded either on the NYSE, AMEX or NASDAQ. We required the firms to have balance sheet information from 1997 to 1999. Our final sample that match these criteria is presented in table 3; panel A presents our first set of banking portfolios and panel B which presents our second set of portfolios.

Table3. The number of firms in each of the portfolios and sub portfolios.

Panel A		Panel B	
Sub-Industry Portfolios	No. Of Firms	Sub-Industry Portfolios	No. Of Firms
a. Money Center Banks	3	a. Banks with a Section 20 subsidiary.	17
b. Super Regional Banks	4	b. Banks that never had a Section 20 but now have a Financial Subsidiary.	13
c. All Other banks	336	c. All Other banks.	313
Total Banks	343	Total Banks	343

We use return information of the sample firms from January 1998 to December 2000 to estimate each of our models.

2.5.2 Macro variables

Data for the two macro-economic variables used in our study is obtained from the Board of Governors of the Federal Reserve System¹⁴. For foreign exchange we used the Major Country Index¹⁵ from the Board of Governors of the Federal Reserve System. The return is calculated using the following formula¹⁶:

¹³ Similar hypotheses were tested by Binder (1985a) and Cornett and Tehranian (1990).

¹⁴ All the information is available online from <http://www.federalreserve.gov>

¹⁵ The major currencies index is a weighted average of the foreign exchange values of the U.S. dollar

$$Rf_t = \frac{F_t - F_{t-1}}{F_{t-1}} \quad (6)$$

Here, F_t is the value of the Major Country Index at time t . To be consistent with the literature,¹⁷ we use the one-year T-bill rate as a proxy for the interest rate. Interest rate returns are computed using the following formula¹⁸:

$$Rr_t = \frac{R_t - R_{t-1}}{R_{t-1}} \quad (7)$$

Here, R_t is the interest rate on one year t-bill at time t . Actual returns are used because there is no difference in the results regardless of whether interest rates are anticipated¹⁹; also, we do not orthogonalize the indices²⁰.

2.5.3 Event Selection

The selection of events in a regulatory event is much more difficult than standard studies that concern corporate announcements, as argued by Binder (1985a). We use LexisNexis wire service to retrieve all news regarding the GLBA. Our search period started November 1, 1998 (Senator Gramm took over as chair of The Senate Banking Committee) and extended to November 12, 1999 (president Clinton signed the bill into law). Our basic search resulted in more than 600 different news items from the LexisNexis database. In table 4 we summarize the important events and dates.

against a subset of currencies in the broad index that circulate widely outside the country of issue. The weights are derived from those in the broad index.

¹⁶ Same as that used by Wetmore and Brick (1994).

¹⁷ Kane and Unal (1998), Flannery and James (1984), and Wetmore and Brick (1994).

¹⁸ Same as that used by Wetmore and Brick (1994).

¹⁹ Flannery and James (1984).

²⁰ Giliberto (1985) argues that orthogonalizing the indices results in biased estimators. Moreover not apparent which index is the driving index and which is the driven one., Kane and Unal (1998) argue that it is

Table 4: Timeline of the Gramm-Leach-Bliley Act.

Note: The first column 'Date' is the event date. If the event occurred after the trading closed for a day then that the next trading day is the event date. Event Window is defined as Event Date, -1 day and +1 day. The second column 'Event' describes the main event.

Date	Event
11/4/98	1. (i) Senator Alfonse D'Amato lost his re-election bid (11/03/98 –night). (ii) Senator Gramm to take over as a chair of Senate Banking Committee. (11/04/98).
1/8/99	2. Financial Services Reform Bill is reintroduced in Congress.
2/17/99	3. Draft bill was unveiled in the Senate.
4/12/99	4. Senator Gramm meets with Senate Minority leader to work on the bill.
4/28/99	5. Senate Banking Committee formally files the Financial Services Modernization Act in the Senate.
5/4/99	6. Clinton raises the privacy issue to be included in the bill.
05/06/99 – Midnight	7. Senate passes S. 900. Senate version of the Bill is passed.
7/1/99	8. House version of the bill was passed.
10/15/99	9. Federal Reserve and Treasury announce agreement on the regulation.
10/22/99	10. Gramm makes deal with White House on CRA.
11/02/99	11. Joint House Conference report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.
11/4/99	12. Senate passes the bill (90-8) and House passes the bill (362-57).
11/12/99	13. President Clinton signs the bill into law.

Table 5: Estimation of Overall impact of the law.

In this table we estimate the overall impact of the law using the model presented by equation 1.

$$R_{it} = \alpha_i + \beta_{i1}Rm_{i-2} + \beta_{i2}Rm_{i-1} + \beta_{i3}Rm_i + \beta_{i4}Rm_{i-2} * D + \beta_{i5}Rm_{i-1} * D + \beta_{i6}Rm_i * D + \delta_i Rr_i + \kappa_i Rf_i + \gamma_i DG_i + e_{it}$$

The model is estimated using the SUR methodology. DG is a dummy variable which is equal to 1 over all the events and zero otherwise so the coefficient of DG , i.e. γ captures the overall impact of GLB and D is the dummy which is equal to 1 after the enactment of the regulation (11/12/99) and zero otherwise.

Panel A:							Panel B:					
Parameter	Money Center Banks		Super Regional Banks		All other Banks		Banks with a Section 20 subsidiary		Banks with a Financial Subsidiary that never had a Section 20 subsidiary		All other Banks	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
α	0.000	-0.693	0.000	0.294	0.000	1.050	0.000	-0.066	0.000	1.233	0.000	0.497
$\alpha * D$	0.000	0.088	0.001	0.686	0.000	0.691	0.000	0.733	0.000	0.643	0.000	0.138
β_1	-0.044	-1.402	-0.023	-0.774	-0.020	-1.091	-0.038	-1.543	-0.042 *	-1.685	-0.006	-0.301
β_2	-0.036	-1.130	-0.017	-0.569	0.027	1.476	-0.056 **	-2.295	-0.017	-0.691	0.095 ***	5.126
β_3	1.307 ***	41.425	1.193 ***	40.544	0.911 ***	49.243	1.170 ***	47.843	1.077 ***	42.756	0.844 ***	45.684
β_4	-0.171 ***	-2.828	-0.192 ***	-3.407	-0.164 ***	-4.615	-0.188 ***	-3.988	-0.132 ***	-2.733	-0.169 ***	-4.781
β_5	-0.154 **	-2.554	-0.122 **	-2.164	-0.206 ***	-5.809	-0.129 ***	-2.750	-0.209 ***	-4.324	-0.232 ***	-6.553
β_6	-0.529 ***	-8.743	-0.454 ***	-8.027	-0.260 ***	-7.311	-0.442 ***	-9.414	-0.470 ***	-9.710	-0.151 ***	-4.247
γ	<u>0.008</u> ***	3.670	<u>0.005</u> **	2.452	<u>0.004</u> ***	2.844	<u>0.006</u> ***	3.389	<u>0.004</u> **	2.445	<u>0.004</u> ***	3.339
δ	0.057	0.911	0.024	0.416	0.053	1.436	0.036	0.736	0.031	0.625	0.078 **	2.124
κ	-0.085 ***	-3.398	-0.078 ***	-3.300	-0.047 ***	-3.167	-0.088 ***	-4.541	-0.077 ***	-3.812	-0.021	-1.400
R^2	0.431		0.421		0.531		0.506		0.445		0.509	
N	3		4		336		17		13		313	

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

2.6 *Empirical Results*

2.6.1 *Overall impact of the law*

Table 5 presents the results from estimation of overall impact of the law. The results for this estimation of our first set of portfolios is presented in panel A. Money Center Banks have the highest gain from this law of 0.80% (average abnormal return), which is significant at the 1% level, Super Regional Banks have a gain of 0.50%, which is also significant at the 1% level. The portfolio of all other banks had a gain of 0.4% (significant at the 1% level). These results support our second hypothesis that the big banking firms have more to gain from the GLBA. We also test whether the overall impact of the act for any two portfolios are equal. These results are presented in panel A of table 6. These are all Wald tests and based on the model presented by equation 4. In all three pairs of Wald tests we find that the null hypothesis in which the economic impact on any two portfolios are equal are rejected at the 1% level.

Panel B of table 5 presents the overall impact on the second classification of banking portfolios. We find that banks that have a Section 20 subsidiary have a higher overall gain (a cumulative average abnormal return of 0.60%). These results support our third hypothesis that banks experienced with non-banking activities (banks with the Section 20 investment subsidiary), benefit more due to the passage of the law. We also test whether the overall impact of the law for any two portfolios is equal. These results are presented in panel B of table 6. In all the three pair tests, we find that the null hypothesis in which the economic impact on any two portfolios are equal are rejected.

Table 6. Test of the hypothesis that all abnormal returns for each portfolio are jointly equal to zero.

Column 2 of this table presents the Wald test for Hypothesis 10, which measures the significance of portfolio returns for all 13 announcements jointly. The underlying distribution is a χ^2 with 1 degree of freedom.

	Null Hypothesis	Wald test $\chi^2(1)$
Panel A	1. Money Center Banks and Super Regional Banks have the same impact due to this law.	6.567**
	2. Money Center Banks and portfolio of all the other banks have the same impact due to this law.	9.670***
	3. Super Regional Banks and portfolio of all the other banks have the same impact due to this law.	5.150**
Panel B	1. Banks with a Section 20 subsidiary and Banks with a Financial subsidiary that never had a Section 20 subsidiary have the same impact due to this law.	5.273**
	2. Banks with a Section 20 subsidiary and portfolio of all other banks have the same impact due to this law.	9.067***
	3. Banks with a Financial Subsidiary that never has a Section 20 subsidiary and portfolio of all other banks have the same impact due to this law.	5.904**

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

2.6.2 Impact of the Act on Systematic Risk

Table 5 shows that the shift in the exposure to systematic risk is negative and significant for all portfolios in both the categories. This confirms our fifth hypothesis that the diversification opportunity and measures to restrict excessive risk taking have reduced the exposure to systematic risk.

2.6.3 Other Hypotheses

The main advantage of using the SUR (Seemingly Unrelated Regression) methodology is the ability to do joint hypothesis testing since heteroscedasticity across equations and contemporaneous dependence of the disturbances are explicitly incorporated into the hypothesis test. The following hypothesis tests are based on the estimation of the model presented in equation 2.

Table 7: Estimation of modified Market model with 3 portfolio of banking industry and test of hypothesis 6

Panel A of the following table presents the estimation results of the following model:

$$R_{it} = \alpha_i + \beta_{i1}Rm_{t-2} + \beta_{i2}Rm_{t-1} + \beta_{i3}Rm_t + \beta_{i4}Rm_{t-2} * D + \beta_{i5}Rm_{t-1} * D + \beta_{i6}Rm_t * D + \delta_i Rr_t + \kappa_i Rf_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it}$$

for portfolios of Money Center Banks, Super Regional Banks and all other banks in our sample. The model is estimated using SUR. D_{kt} is a dummy variable which is equal to 1 over the event windows, and the estimate of coefficient of the dummy i.e. γ_{ik} presents the estimate of the cumulative average abnormal return of the k th event. Rm represents the return of market index, δ_i is foreign exchange risk coefficient for portfolio i and κ_i is the interest rate risk coefficient for portfolio i . D is a dummy variable which is equal to 1 after the enactment of the regulation (11/12/99) and zero otherwise. Panel B presents the test of the hypothesis that the events have symmetric impact across the industry.

	Panel A							Panel B
	Money Center Banks		Super Regional Banks		All Other Banks		$\chi^2(3)$	Wald test
Parameter	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat		
Model Parameters	α	0.000	-0.680	0.000	0.296	0.000	1.038	
	$\alpha *$	0.000	0.084	0.001	0.689	0.000	0.699	
	β_1	-0.049	-1.558	-0.022	-0.754	-0.020	-1.087	
	β_2	-0.037	-1.174	-0.016	-0.541	0.030	1.610	
	β_3	1.305***	41.429	1.192***	40.515	0.912***	49.341	
	β_4	-0.166***	-2.745	-0.193***	-3.420	-0.164***	-4.620	
	β_5	-0.152**	-2.533	-0.123**	-2.181	-0.208***	-5.891	
	β_6	-0.528***	-8.745	-0.452***	-8.017	-0.261***	-7.364	
	δ	0.054	0.861	0.021	0.364	0.050	1.370	
	κ	-0.089***	-3.528	-0.078***	-3.325	-0.047***	-3.177	
Event parameters	γ_1	0.019***	2.618	0.016**	2.388	0.008*	1.780	8.098**
	γ_2	0.024***	3.251	-0.002	-0.290	-0.005	-1.071	27.811***
	γ_3	0.015**	2.017	0.009	1.317	0.009**	2.032	5.177
	γ_4	-0.001	-0.070	0.005	0.784	0.009**	2.093	7.866**
	γ_5	0.012*	1.691	0.021***	3.096	0.012***	2.709	10.483***
	γ_6	-0.004	-0.424	-0.010	-1.219	0.000	0.070	3.116
	γ_7	-0.003	-0.322	0.008	0.936	-0.002	-0.333	3.119
	γ_8	-0.001	-0.177	0.001	0.112	-0.004	-0.992	2.300
	γ_9	0.000	0.045	-0.001	-0.190	0.002	0.495	0.815
	γ_{10}	0.017**	2.338	-0.001	-0.089	0.005	1.159	9.249**
	γ_{11}	0.007	0.742	-0.003	-0.323	0.005	0.930	3.025
	γ_{12}	0.009	1.028	0.010	1.218	0.003	0.661	1.810
	γ_{13}	0.001	0.184	0.006	0.843	0.002	0.526	0.875
R^2	0.434		0.425		0.534			
N	3		4		336			

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Panel A of Table 7 presents the SUR estimation results, cumulative average abnormal return and corresponding t-statistics for each of the 13 events for the three portfolios. It also presents model parameter estimates; market betas (current and lag), foreign exchange risk coefficients (δ) and interest rate risk coefficients (κ). Panel B presents the results of hypothesis 6 for our first classification of banking firms.

Five events produced significant cumulative average abnormal returns for the Money Center Banks. The news of Senator Gramm taking over as Senate Banking Committee Chair on November 4, 1998 created an average abnormal return of 1.9%. When the Financial Services Reform bill was reintroduced in Congress on January 8, 1999, Money Center Banks experienced an average abnormal return of 2.4% (significant at the 1% level). Moreover, when the draft of the bill was unveiled in the Congress, Money Center Banks had a 1.5% average abnormal return. The fourth event was when the Senate Banking Committee formally filed the Financial Services Modernization Act with Congress on April 12, 1999, and there was a 1.2% average abnormal return. The fifth event occurred is when Senator Gramm made a deal with the White House on the CRA provision on October 22, 1999, which virtually removed the last big hurdle to the passage of the GLBA, and the average abnormal return (AR) on this event was 1.1% and significant at the 10% level.

On the other hand, Super Regional Banks only had significant stock market reactions on two different occasions. The first of these events was the news of Senator Alfonse D'Amato's loss of his New York re-election on November 3, 1998 coupled with the news of Senator Gramm's appointment as Senate Banking Committee chair on November 4, 1998. These events together produced an abnormal return of 1.6%. The

second event was when the Senate Banking Committee formally filed the Financial Services Modernization Act with Congress on April 12, 1999, and there was a 2.1% average abnormal return.

In addition to the events where Super Regional Banks have significant stock market reactions, the portfolio of all other banks have significant cumulative average abnormal returns on 2 additional occasions. First, when the draft bill was unveiled in the Senate on February 17, 1999 there was only a 0.9% abnormal return, which is significant at the 5% level. Second, when Senator Gramm met with the minority leaders to work on the bill, there was a reaction of 1.2%.

Panel B of Table 7 presents the Wald test for Hypothesis 7 for each of the announcements. This hypothesis tests whether the information produced during the k th event window has the same impact over all three portfolios. The null hypothesis is:

$$H_0: \gamma_{ik} = 0 \quad \forall i$$

As reported in the table, in events 1, 2, 4, 5 and 10 the χ^2 test statistics are 8.098, 27.811, 7.866, 10.483, and 9.249 respectively, which rejects the null hypotheses. This means that over these five events windows, the impact of the announcement is asymmetric across the three portfolios.

For our second set of portfolios, the SUR estimation results, cumulative average abnormal return and corresponding t-statistics for each of the 13 events for the three portfolios are presented in Table 8.

Table 8: Estimation of modified Market model with 3 portfolio of banking industry and test of hypothesis 6

Panel A of the following table presents the estimation results of the following model:

$$R_{it} = \alpha_i + \beta_{i1}Rm_{t-2} + \beta_{i2}Rm_{t-1} + \beta_{i3}Rm_t + \beta_{i4}Rm_{t-2} * D + \beta_{i5}Rm_{t-1} * D + \beta_{i6}Rm_t * D + \delta_i Rr_t + \kappa_i Rf_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it}$$

for portfolios of banks that had a Section 20 subsidiary, banks that now have the new Financial Subsidiary and all other banks in our sample. The model is estimated using SUR. D_{kt} is a dummy variable which is equal to 1 over the event windows, and the estimate of the coefficient of the dummy, i.e. γ_{ik} , presents the estimate of the cumulative average abnormal return of the kth event. Rm represents the return of market index, δ_i is foreign exchange risk coefficient for portfolio i and κ_i is the interest rate risk coefficient for portfolio i. D is a dummy variable which is equal to 1 after the enactment of the regulation (11/12/99) and zero otherwise. Panel B presents the test of the hypothesis that the events have symmetric impact across the industry.

	Panel A							Panel B
	Banks that had a Section 20 subsidiary			Banks that never has a Section 20 but have a section 4K4E subsidiary		All Other Banks		Wald test
Parameter	Estimate	t-stat		Estimate	t-stat	Estimate	t-stat	$\chi^2(3)$
Model Parameters	α	0.000	-0.063	0.000	1.209	0.000	0.508	
	α	0.000	0.734	0.000	0.657	0.000	0.136	
	β_1	-0.039	-1.591	-0.039	-1.566	-0.009	-0.465	
	β_2	-0.055**	-2.278	-0.012	-0.460	0.095***	5.124	
	β_3	1.170***	47.840	1.078***	42.848	0.844***	45.684	
	β_4	-0.186***	-3.960	-0.135***	-2.796	-0.166***	-4.695	
	β_5	-0.129***	-2.758	-0.214***	-4.452	-0.232***	-6.564	
	β_6	-0.442***	-9.429	-0.471***	-9.760	-0.151***	-4.253	
	δ	0.034	0.694	0.026	0.513	0.076**	2.065	
	κ	-0.090***	-4.586	-0.077***	-3.862	-0.022	-1.467	
Event parameters	γ_1	0.015***	2.621	0.014**	2.388	0.008*	1.831	7.521*
	γ_2	0.003	0.542	-0.008	-1.350	0.007*	1.717	15.056***
	γ_3	0.009	1.573	0.015***	2.717	0.009**	2.104	8.132**
	γ_4	0.010*	1.692	0.003	0.576	0.004	0.816	3.794
	γ_5	0.016***	2.863	0.013**	2.277	0.009**	2.182	8.301**
	γ_6	-0.002	-0.308	0.001	0.194	-0.004	-0.702	1.348
	γ_7	-0.001	-0.188	0.001	0.164	-0.002	-0.307	0.392
	γ_8	0.000	-0.076	-0.008	-1.412	-0.002	-0.501	3.810
	γ_9	0.002	0.301	0.005	0.820	-0.001	-0.196	1.732
	γ_{01}	0.004	0.718	0.007	1.214	0.009**	2.201	6.471*
	γ_{11}	0.005	0.716	0.001	0.113	0.006	1.074	1.965
	γ_{21}	0.010	1.441	0.001	0.070	0.004	0.768	4.000
	γ_{31}	0.001	0.123	0.004	0.741	0.003	0.741	1.341
	R^2	0.508155		0.448447		0.511568		
	N	17		13		313		

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

It also presents model parameter estimates for the market betas (current and lag), foreign exchange risk coefficient (δ) and interest rate risk coefficient (κ). Panel B presents the results of hypothesis 6

Banks that had a Section 20 subsidiary have highly significant abnormal return (1% level) on two different occasions. First is the news of Senator Alfonse D'Amato's loss of his New York re-election on November 3, 1998, coupled with the news of Senator Gramm's succession to become Senate Banking Committee chair on November 4, 1998 and when the Senate Banking Committee formally files the Financial Services Modernization Act in the Senate on April 28, 1999. These banks had a moderate reaction to the news that Senator Gramm will meet with the minority leaders to work on the bill.

On the other hand, banks with a new Financial Subsidiary have highly significant abnormal returns on three different events. These events are events 1, 3, and 5. The cumulative average abnormal returns on these events are 1.4%, 1.5%, and 1.3%.

The portfolio of all other banks in this category has significant cumulative average abnormal returns on six different occasions. The first of these events was the news of Senator Alfonse D'Amato's loss of his New York re-election on November 3, 1998 coupled with the news of Senator Gramm's succession to become Senate Banking Committee chair on November 4, 1998 that has an average return of 0.8%. When the Financial Services Reform Bill was reintroduced in Congress on January 8, 1999, it has an average return of 0.7%. The third event was when the draft bill was unveiled in Congress on February 17, 1999 and it created an average abnormal return of 0.9%. The fourth event was when the Senate Banking Committee formally filed the Financial Services Modernization Act in the Senate; it created an average return of 0.9%. The fifth

event was when Senator Gramm made a deal with the White House on the CRA (Community Reinvestment Act) virtually removing the large big hurdle to the GLBA on October 22, 1999 and it created an average abnormal return of 0.9% for the portfolio.

The null hypothesis that the events have created symmetric impact on these portfolios is rejected at five different counts, events 1, 2, 3, 5 and 10. This hypothesis is tested using a Wald test. The underlying distribution is $\chi^2(3)$. This result is presented in Panel B of Table 8.

Table 9: Test of the hypothesis that all the announcements have same impact on the portfolios of the banking industry.

Column 2 of this table presents the Wald test for Hypothesis 7 which measures the significance of portfolio returns for all 13 announcements jointly. The underlying distribution is a χ^2 with 13 degrees of freedom.

	Null Hypothesis	Wald test $\chi^2(13)$
Panel A	All abnormal returns for Money Center Banks are jointly equal to zero.	31.473***
	All abnormal returns for Super Regional Banks are jointly equal to zero.	22.387**
	All abnormal returns for portfolio of all other banks are jointly equal to zero.	24.341**
Panel B	All abnormal returns for Banks with a Section 20 subsidiary are jointly equal to zero.	23.854**
	All abnormal returns for Banks with a Financial Subsidiary are jointly equal to zero.	25.156**
	All abnormal returns for portfolio of all other banks are jointly equal to zero.	23.900**

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Here we test whether every announcement has the same impact on the same portfolio. We use the Wald test for this hypothesis test. The underlying distribution is χ^2 with 13 degrees of freedom. The results for our first category of portfolios is presented in Panel A and the results for the second set of portfolios are presented in Panel B of Table 9. The results for all six portfolios show that the null hypothesis is rejected. It implies

that the events leading to the passage of the GLBA had different impacts on the different portfolios.

2.6.4 *Specification Tests*

The result of the specification test for our portfolio model shows that the null hypothesis $H: \theta = 0$ is rejected at the 1% level for two different portfolio categories. This means that the variance covariance matrix is non-diagonal. Statistically this means that SUR is the correct model to choose as opposed to the OLS.

2.7 *Cross Sectional Analysis*

2.7.1 *Methodology*

The goal of the cross-sectional models is to identify firm specific characteristics that can help us explain the cross sectional variation in abnormal return.

2.7.1.1 *Average Abnormal Return (AR)*

In order to identify the firm specific characteristics, we first need to generate the AR for each firm over each of the event windows of interest. To do this we use the exact same model used for the portfolio study. Formally the model is:

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it} \quad (8)$$

Here, D_{kt} is the dummy variable that equals 1 on each of the event windows and zero otherwise. We also generate these ARs using a dummy that is equal to 1 for every

event window and zero otherwise to measure the overall average return, using the following model:

$$R_{it} = \alpha_i + \alpha'_i D + \beta_{i1} Rm_{t-2} + \beta_{i2} Rm_{t-1} + \beta_{i3} Rm_t + \beta_{i4} Rm_{t-2} * D + \beta_{i5} Rm_{t-1} * D + \beta_{i6} Rm_t * D + \delta_i Rf_t + \kappa_i Rr_t + \gamma_i DG_t + e_{it} \quad (9)$$

We also generate the β_{i4} - β_{i6} that we use in the cross-sectional regression.

2.7.2 Cross-sectional Model

In order to further investigate the characteristics of winner and losers in the banking industry, we estimate an Ordinary Least Square (OLS) model where the dependent variable is the AR estimated using equation 8 or equation 9 (depending on whether we are investigating an individual event or overall impact). We analyze an individual event if two or more portfolios of any category have a significant return on that event. The dependent variables are SIZE, ROA and shift in exposure to systematic risk. We use the following models for our cross-sectional analysis:

$$\begin{aligned} AR_i = & \theta + \theta_{SIZE} SIZE + \theta_{SIZE \times MONEY} (SIZE \times MONEY) + \theta_{SIZE \times SUPER} (SIZE \times SUPER) \\ & + \theta_{ROA} ROA + \theta_{ROA \times MONEY} (ROA \times MONEY) + \theta_{ROA \times SUPER} (ROA \times SUPER) \\ & + \theta_{RISK} RISK + \theta_{RISK \times MONEY} (RISK \times MONEY) + \theta_{RISK \times SUPER} (RISK \times SUPER) + \xi \end{aligned} \quad (10)$$

$$\begin{aligned} AR_i = & \theta + \theta_{SIZE} SIZE + \theta_{SIZE \times SEC20} (SIZE \times SEC20) + \theta_{SIZE \times SEC4K} (SIZE \times SEC4K) \\ & + \theta_{ROA} ROA + \theta_{ROA \times SEC20} (ROA \times SEC20) + \theta_{ROA \times SEC4K} (ROA \times SEC4K) \\ & + \theta_{RISK} RISK + \theta_{RISK \times SEC20} (RISK \times SEC20) + \theta_{RISK \times SEC4K} (RISK \times SEC4K) + \xi \end{aligned} \quad (11)$$

Here, SIZE is measured taking the log of the book value of assets. It is expected that the bigger banks are going to have the best opportunity to exploit the economies of

scope that the GLBA has to offer. Deregulation and court rulings (example: Section 20 subsidiary provision or rulings concerning the banks right to sell insurance products) that deregulated the financial services industry mostly benefited the larger firms. Thus we expect that SIZE should be positive and significant.

Return on Assets (ROA) is a measure of overall performance and we expect that better performing banks are the best positioned to expand their business in this new deregulated era. We expect this variable to be positive and significant. We also expect that the change in the exposure to systematic risk will be negative implying that the regulation has created diversification opportunities and also the regulation against excessive risk taking has made the industry less prone to bankruptcy.

2.7.3 Empirical Results

Table 10 presents the estimation results of equation 11 (for our first category of portfolios). We examine 3 different events and the overall impact in Table 10. For all 3 events and for overall impact, we find that the intercept is negative and significant. The cross dummy between Money Center banks and the change in exposure to systematic risk is highly significant and positive for events 1 and 5; for overall impact for this category of banks, the exposure to systematic risk has increased, while in event 3 it decreased.

Table 10: Cross sectional determinants of the impact for Money Center Banks, Super Regional Banks and All other banks in the sample.

Cross-section regression for Money Center Banks, Super Regional Banks and all the other banks in our sample. The table shows the estimation result of the following model:

$$AR_i = \theta + \theta_{SIZE} SIZE + \theta_{SIZE \times MONEY} (SIZE \times MONEY) + \theta_{SIZE \times SUPER} (SIZE \times SUPER) \\ + \theta_{ROA} ROA + \theta_{ROA \times MONEY} (ROA \times MONEY) + \theta_{ROA \times SUPER} (ROA \times SUPER) \\ + \theta_{RISK} RISK + \theta_{RISK \times MONEY} (RISK \times MONEY) + \theta_{RISK \times SUPER} (RISK \times SUPER) + \xi$$

Here AR is the average abnormal returns and θ_{RISK} is the change in the exposure to systematic risk are generated from equation 8 and equation 9. MONEY and SUPER are dummy variables, which are equal to 1 if the bank is a Money Center Bank or if it is a Super Regional Bank, and zero otherwise. SIZE is measured taking the log of the book value of asset; ROA is return on Asset. θ_{SIZE} is the coefficient estimate of SIZE for all other firms, while $\theta_{SIZE \times MONEY}$ is the difference in coefficient estimate of SIZE variable for all other firms with Money Center Banks and $\theta_{SIZE \times SUPER}$ is the difference in coefficient estimate of SIZE variable for all other firms with Super Regional Banks. The coefficient estimates for ROA and RISK are defined likewise.

	Panel A			Panel B
	Event 1	Event 3	Event 5	Overall Impact
θ	-0.371***	-0.356***	-0.557***	-0.004*
θ_{RISK}	0.074	0.021	-0.011	0.001
$\theta_{RISK \times money}$	23.058***	-2.611***	14.159***	0.169***
$\theta_{RISK \times super}$	0.094	-0.849***	-0.856	-0.010***
θ_{SIZE}	0.0569***	0.050***	0.0777***	0.001***
$\theta_{SIZE \times money}$	0.207***	-0.031***	0.101***	0.001***
$\theta_{SIZE \times super}$	0.049	0.001	-0.018	-0.001*
θ_{ROA}	0.008	0.014	0.081*	-0.003
$\theta_{ROA \times money}$	12.141***	-1.027***	7.515***	0.090***
$\theta_{ROA \times super}$	-0.252	-0.316***	0.020	0.001
R^2	0.083	0.095	0.150	0.174
F	3.329***	3.885***	6.520***	7.820***

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

The change in exposure to systematic risk for Super Regional banks is negative and highly significant in event 3 and for overall impact. The change in exposure to systematic risk is not significant for the reference group (for all other banks in this category). Size is positive and significant for the reference group in the three events and for overall impact. The cross dummy between Money Center banks and size is highly significant and positive in all cases except for event 3. The cross dummy between Money Center banks and ROA is highly significant and positive in all the cases except for event 3. Profitability is moderately significant in event 5 for the reference group and the cross

dummy between Super Regional banks and ROA is highly significant but negative in event 3. Thus, SIZE, change in exposure to systematic risk, and overall performance can explain the cross sectional wealth effects.

Table 11: Cross sectional determinants of the impact for banks with Section 20 subsidiary, banks that now have newly created *Financial Subsidiary* and all other banks in our sample.

Cross-section regression for banks with Section 20 subsidiary, banks that now have newly created *Financial Subsidiary* and all other banks in our sample. The table shows the estimation result of the following model:

$$AR_i = \theta + \theta_{SIZE} SIZE + \theta_{SIZE \times SEC20} (SIZE \times SEC20) + \theta_{SIZE \times SEC4K} (SIZE \times SEC4K) \\ + \theta_{ROA} ROA + \theta_{ROA \times SEC20} (ROA \times SEC20) + \theta_{ROA \times SEC4K} (ROA \times SEC4K) \\ + \theta_{RISK} RISK + \theta_{RISK \times SEC20} (RISK \times SEC20) + \theta_{RISK \times SEC4K} (RISK \times SEC4K) + \xi$$

Here AR is the average abnormal returns and θ_{Riak} is the change in the exposure to systematic risk generated from equation 8 and equation 9. SEC20 and SEC4k are dummy variables, which are equal to 1 if the bank has a Section 20 subsidiary or a new FS respectively, and zero otherwise. SIZE is measured taking the log of the book value of asset; ROA is the return on assets. θ_{SIZE} is the coefficient estimate of SIZE for all other firms, while $\theta_{SIZE \times sec20}$ is the difference in coefficient estimate of SIZE variable for all other firms with banks that has sec 20 subsidiary and $\theta_{SIZE \times sec4k}$ is the difference in coefficient estimate of SIZE variable for all other firms with banks that has a sec 4k subsidiary. The coefficient estimates for ROA and RISK are defined likewise.

	Panel A			Panel B
	Event 1	Event 3	Event 5	Overall Impact
θ	-0.355***	-0.346***	-0.544***	-0.004
θ_{RISK}	0.125	0.048	-0.012	0.002
$\theta_{RISK \times sec20}$	-0.179	-0.527*	-0.619***	-0.007**
$\theta_{RISK \times sec4k}$	-0.409	-0.285	0.188	-0.003*
θ_{SIZE}	0.055***	0.049***	0.075***	0.001***
$\theta_{SIZE \times sec20}$	0.038***	-0.006	-0.013	0.000
$\theta_{SIZE \times sec4k}$	-0.063*	0.015	0.026	-0.001**
θ_{ROA}	0.003	0.014	0.086**	-0.003
$\theta_{ROA \times sec20}$	-0.279***	-0.085	-0.024	0.000
$\theta_{ROA \times sec4k}$	0.530*	-0.128	-0.182	0.005**
R^2	0.097	0.095	0.150	0.183
F	3.979***	3.876***	6.527***	8.265***

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Table 11 presents the estimation results of equation 12 (for our second category of portfolios). We examined 3 different events and the overall impact in Table 11. For all 3 events the intercept is negative and significant. The change in exposure to systematic

risk is insignificant for the reference group (banks that do not have either a Section 20 subsidiary or a new financial subsidiary), but is negative and significant for the cross dummy between banks with a Section 20 subsidiary in events 3 and 5, and for overall impact. The cross dummy for banks with a new financial subsidiary and the change in exposure to systematic risk is negative and significant for overall impact. Size is positive and significant for the reference group. The cross dummy between banks with a new financial subsidiary and size is negative and significant in event 1 and for overall impact. Profitability is significant in event 5 for the reference group. For this categorization, we can also generalize that mainly SIZE, but also the change in exposure to systematic risk and overall performance can explain the cross sectional wealth effects.

2.8 Conclusion

In this paper we investigate the impact of announcements that led to the passage of the GLBA on the banking industry. We investigate the impact on this traditional classification of banks like Money Center and Super Regional Banks. The results show that Money Center Banks have the highest wealth effect followed by Super Regional Banks. Due to the explicit measures taken by the GLBA and due to the diversification opportunities, the exposure to systematic risk has reduced substantially for these two categories of banks, as well as for the rest of the industry.

We also investigate the non-traditional classification of banks such as banks that had a Section 20 subsidiary and banks that now have a new Financial Subsidiary. Our results show that in this classification banks that had a Section 20 subsidiary were the

biggest gainer and the change in exposure to systematic risk is also negative and significant for all the categories of banks in this classification.

In the cross-section regression we find that larger firms are the most benefited from this law, which is consistent with previous studies. However, the relation between performance and wealth effect is not conclusive like some of the previous studies. The most important contribution of this study is that we show how a change in exposure to systematic risk can explain cross-sectional variation for Money Center banks, Super Regional Banks, banks with a Section 20 subsidiary and banks with a new financial subsidiary, which is significantly different from their reference group.

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Chapter III

Financial Services Modernization Act of 1999: Market Assessment of Winners and Losers in the Insurance Industry

3.1 Abstract

This paper investigates the impact of the Financial Services Modernization Act (GLBA) of 1999 on the insurance industry. We identify six events that have a differential impact across the business lines of the insurance industry. The overall impact of the GLBA across the business lines in the insurance industry is positive and the impact on each business line is significantly different. Firms in property/casualty and life insurance gain more than the rest of the firms in the insurance industry. Exposure to systematic risk is reduced after the GLBA and this can explain the cross-sectional variation of the wealth effect. In cross-sectional analysis we also find, consistent with merger literature, that larger and poorly performing firms benefit from the cross-industry merger opportunities under the GLBA.

3.2 Introduction

The Financial Services Modernization Act also known as Gramm-Leach-Bliley Act (GLBA) of 1999 is the most sweeping deregulation of the U.S. financial services industry in the last century. The GLBA repeals both the depression era Glass-Steagall act of 1933, which separated banking and securities activities, and the Bank Holding

Company Act of 1956 that prohibited bank holding companies from engaging in insurance related activities. Conventional wisdom suggests that while deregulation creates overall shareholder value, the wealth effects of regulatory change are unevenly distributed. We focus on the prediction that shareholders benefit from risk reduction under the GLBA due to regulatory changes and newly created merger opportunities across financial services.

Research in this area borrows from the Mergers and Acquisitions literature to identify potential winners and losers as the GLBA allows for mergers between firms in different sectors of the financial services industry.¹ Larger firms will likely benefit from the GLBA as they have more available resources to acquire firms across industries and achieve economies of scope. Poorly performing firms will become the likely targets, as these poorly managed firms can be purchased at a discount. Deregulation affords firms the opportunity to diversify across financial sectors. Within the insurance industry those product lines that are easily cross-marketed will be more attractive merger targets.

Current research finds that the GLBA does not have a uniform effect on the financial services industry. Studies consistently find that the GLBA positively affects shareholder value in the insurance industry; however, depending on the sample size and number of events investigated, the results for other financial services industries are mixed. Carow and Heron (2002) find that only the insurance industry gains from this law. Akhigbe and Whyte (2001) find that all the sectors of the Financial Services Industry (FSI) benefit from this law, while Hendershott, Lee, and Tompkins (2002) conclude that this law doesn't impact the banking industry. Larger banks with experience

¹ Jensen and Ruback (1983) provides a survey of this literature.

in the insurance business are likely to expand their business by acquiring insurance companies.² Houston and Ryngaert (1994) find that target firms typically sell at premiums and acquiring firms sell at discounts. Carow (2001b), and Johnston and Madura (2000) who investigate the only bank-to-insurance merger (Citicorp and Travelers, 1998) find significantly positive returns for insurance companies.

Size is important for exploiting merger opportunities. For example, Hawawini and Swary (1990) find that acquirers are significantly larger than targets. Calem (1994) finds that after bank holding company branching reforms, large banks acquired small banks. In addition, Cheng, Gup and Wall (1989), and Palia (1993) find that larger acquiring firms add more to target bank value.

There is evidence that poorly performing firms become potential targets for mergers. BarNiv and Hathorn (1997) find that timely mergers in the insurance industry serve as an alternative to insolvency in 20% to 46% of the mergers considered in their study. Similarly Whiting (1997) argues that banking organizations with higher ROEs (Return on Equity) or ROAs (Return on Asset) are more likely to purchase insurers that have lower ROE or ROA. Swary (1986) shows that target banks with higher capital ratios than their bidder banks have greater abnormal returns. Thus, it seems that abolishing cross-industry merger barriers will create wealth effects for poorly performing firms.

The GLBA may create diversification benefits for the financial services industry by removing merger barriers. Wall, Reichert and Mohanty (1993) investigate whether combinations of bank and non-bank firms can reduce a banking organizations' operating

² The presence of banking firms in the insurance business before passage of the GLBA is also very strong. For example, Wells Fargo runs the seventh largest insurance agency in the U.S.A. and 50% to 65%

risk. They conclude that the best opportunity for diversification gains is for banks to merge with firms engaged in some aspects of the insurance industry. Boyd, Graham and Hewitt (1993), using simulated data, find that bank holding company (BHC) mergers with life and property/casualty insurance companies reduce risk.

The GLBA also reduces risk by providing safeguards against excessive risk-taking. Under the GLBA, certain activities are restricted; while some activities are limited to the subsidiaries, the GLBA also establishes financial health criteria for expanding business into other sectors, assigns the Federal Reserve Board (FED) to supervise and regulate Financial Holding Companies (FHCs) and gives the FED access to risk data across the entire organization.³ The GLBA has provisions to use market signals to discipline institutions. Moreover, the GLBA proposes that the FED study the feasibility and appropriateness of requiring large banks to issue subordinated debt that will be rated by a major rating agency. Accordingly, if these bond ratings fall below investment grade, then new expansion projects cannot be undertaken.

The merger opportunities created by the GLBA will benefit some lines of insurance business more than others. Johnston and Madura (2000) point out that banks will be interested in cross-selling of insurance products that closely resemble banking products. For example: mortgage and mortgage insurance, auto financing and auto insurance. Saunders and Walter (1994), on the other hand, conclude that greater synergistic gains are available for combination of banks and life insurers than from combinations of banks and property/casualty insurers.

(depending on the method of calculation) of all banking organizations sell insurance products of one kind or another (LaRocco, 1999).

³ Feldman, Lyon and Willardson (2000) summarize legal aspects of the GLBA.

The main contribution of this paper is to empirically examine the diversification opportunities made available under the GLBA. No study to date has investigated whether the posited reductions in operating risk and bankruptcy risk, due to diversification opportunity and safeguards against excessive risk-taking, can create value for stockholders.⁴ We concentrate on the insurance industry for our analysis because the GLBA allows the first opportunity for insurance companies to merge with other types of financial services firms and the literature has identified a consistent wealth effect in the insurance industry. We also test the predictions of Johnston and Madura (2000) and Saunders and Walter (1994) that life and property insurance make more suitable merger candidates than other lines of insurance businesses, thus firms in these lines of insurance business will become suitable targets.

First, we adapted the model used by Blinder (1985), and Cornett and Tehranian (1990), which evolves testing the impact of regulatory changes using financial market data in a seemingly unrelated regression framework. We extend these models from a one-factor model to a three-factor model that is commonly used in the banking literature.⁵ These factors are market exposure, foreign exchange risk exposure and interest rate risk exposure. The foreign exchange risk component is applicable to insurance in general, and property/casualty insurance in particular because of the globalization of U.S. businesses. Interest rate exposure arises from the mismatch in duration of the assets and liabilities of the firms. All financial institutions tend to mismatch their balance sheet

4 Akhigbe and Whyte (2001), investigate whether the risk shifts on the event date and they find no evidence of risk shift for either the insurance or banking industry.

5 Wetmore and Brick (1994) and Choi, Elyasiani and Kopecky (1992).

maturities to some degree.⁶ This risk arises from the difference in timing of rate changes and cash flows, and from changes in the shape of the yield curve.

In our cross-sectional analysis we include: log of book value of total assets to test the size related hypothesis, return on equity to test the performance related hypothesis, and change in exposure to systematic risk to analyze whether shareholders benefit from risk reduction and diversification opportunities. In order to analyze the interaction effect we include size, ROE and change in exposure to systematic risk multiplied by business line dummies. We also include the difference in intercept for different business lines in the insurance industry.

In the portfolio analysis we find that shifts in exposure to market beta are negative and significant for all the portfolios. Each of the business line portfolios has a positive overall wealth effect. Property/casualty and life insurance portfolios have higher gains from the GLBA, and these wealth effects are significantly different from each other. We also find that six different events have a statistically different impact across the business lines.

In cross-sectional analysis, we find that firms in the property/casualty insurance and all other insurance portfolio (except life insurance firms) benefit from risk reduction under the GLBA. Our results also strongly support the general findings of the merger literature. We find that larger firms, irrespective of the business line, gain from this deregulation. Poorly performing firms in the life and property/casualty insurance industries benefit from the GLBA.

⁶ Anthony Saunders(1998) pp. 120-121.

The rest of the study is organized as follows. The second section provides an historical overview. Section three introduces major hypotheses and describes the methodology. Section four describes the data and lists the major events. Section five presents the empirical results. Section six discusses the cross-sectional analysis and a final section concludes.

3.3 History of the GLBA

Bank entry into the insurance business started in 1985 with the OCC (Office of the Comptroller of Currency) ruling that allows banks to sell variable rate annuities. The scope of bank activity in the insurance business widened further in 1986, based on Section 92 of the National Banking Act. Through this act, the OCC ruled that a national bank, or its branch that is located in a place with a population of 5,000 or less, may sell insurance to existing and potential customers, located anywhere. In 1990, the OCC permitted banks to sell fixed rate annuities.

Under the new law (GLBA), insurance remains a state-regulated business (the McCarran-Ferguson Act remains in place). The GLBA repeals sections of the Banking Act of 1933, including sections 20 and 32, which prohibit national banks from maintaining securities firms and bank officials from sitting on corporate boards of insurance companies. It also amends the Bank Holding Company Act of 1956 and creates a new entity known as a Financial Holding Company (FHC). The FHC is the centerpiece of this financial modernization. FHCs may engage in activities that are financial in nature including banking, securities, insurance (underwriting as well as sales as an agent), and merchant banking. To qualify as an FHC each subsidiary has to be well managed and

well capitalized. In addition, the depository subsidiary of the FHCs has to comply with the Community Reinvestment Act (CRA) rating requirement.

The GLBA also creates a new type of subsidiary, known as a ‘financial subsidiary,’ through which banks can conduct many of the same activities as that of a subsidiary of an FHC⁷. A significant exception is that insurance underwriting may not be conducted in a financial subsidiary. However, to own such a financial subsidiary, the GLBA requires that the bank and each of its depository subsidiaries be well managed and well capitalized.

The GLBA also repeals Title VI of the Garn-St. Germain Act, which stated that the sale or underwriting of insurance is “not closely related” to banking, effectively preventing bank holding companies from selling and underwriting insurance. The GLBA also preempts anti-affiliation laws. Any attempt by a state to deny a depository institution from trying to affiliate with an insurer can also be nullified since states are forbidden from discriminating against such entities. Hence, the GLBA allows cross-industry mergers that were not previously allowed under the OCC rulings.

3.4 Hypothesis and Methodology

3.4.1 Hypotheses

We examine five hypothesis related to the effect of the passage of the GLBA on the insurance industry.

Hypothesis 1 (Barriers): *The relaxation of merger barriers will benefit firms.*

The GLBA creates a unique opportunity for cross-industry mergers within the financial services industry. Prior to the GLBA banks were allowed under OCC regulation

to enter the insurance business, but mergers between banks and insurance companies were prohibited. We argue that the GLBA creates economies of scope for firms in the insurance industry by abolishing the merger barrier. Previous studies find a positive wealth effect for insurance firms on the announcement of the Citicorp and Travelers merger. It may be interpreted that this reaction is in anticipation that the regulators would allow more of such mergers in the future.

Hypothesis 2 (Suitability): *More suitable merger targets such as life and property/casualty insurance will benefit more.*

Previous studies hypothesize that banks will be interested in merging with firms that sell actuarial products, which can be easily marketed with traditional banking products and may help them to reduce their operating expenses. They further argue that only a few large banks may choose to underwrite the full line of risk. Prior research suggests that banks will be more interested in life insurance, because greater synergistic gains are available for combinations of banks and life insurers than from combinations of banks and property/casualty insurers. Other studies argue that the cross-marketing benefits with traditional banking products makes property/casualty insurers more suitable as merger targets. In light of this literature we hypothesize that life and/or property insurance will benefit more from deregulation.

Hypothesis 3 (Size): *Larger firms have more resources to take advantage of merger opportunities, therefore will benefit more.*

The GLBA's biggest innovation is the FHC. It allows institutions to offer an array of services (banking, insurance and brokerage) under one roof. Larger institutions have

⁷ Broome and Markham, 2001.

more resources to exploit this opportunity for scope economies created by the GLBA. Furthermore, larger firms in the insurance industry are somewhat insulated from takeover pressure from other sectors that we examine. For example, Carow (2001b) investigates the impact of OCC rulings that let banks into the insurance business and finds that following the enacting of Section 92 regulation, larger insurance companies had higher gains. Thus we expect that larger insurance companies will have a greater wealth effect.

Hypothesis 4 (Performance): *Poorly performing firms are more attractive merger targets, therefore having higher wealth effects.*

Two general findings from the merger literature support the argument that poorly performing firms in the insurance industry will gain from the GLBA. First, the literature that investigates the relationship between insolvency and mergers in the insurance industry find that insolvency is a major motivation on the part of target firms to go into the merger. Thus we expect that the cross-industry merger opportunities created under the new regulation will be regarded as good news for the poorly performing firms in the insurance industry. Secondly, prior researchers in the merger literature find evidence that better performing firms typically takeover poorly performing firms. The general consensus from the merger literature is that target firms' shares sell at a premium as a result of merger announcements. So we expect that the GLBA will create wealth effects for the poorly performing firms in the insurance industry.

Hypothesis 5 (Risk Reduction): *Cross-industry merger opportunities and regulatory changes will reduce risk to stockholders.*

There are several studies that look into the issue of risk that can arise as a result of combining commercial banks with insurance companies and securities firms. Some of

these studies suggest that the combination of banking and –insurance firms will reduce risk while others argue that some adjustments will be necessary to ensure that banks will not take excessive risks. The GLBA has preventive measures to ensure that new financial conglomerates do not take excessive risk or that existing depository institutions expand their business into non-traditional services in a manner that threatens their financial health. It also requires the use of market signals to discipline firms that take excessive risk. Consequently, diversification under the new regulation should not threaten the health of the firms in the financial services industry and hence, will create wealth effects.

3.4.2 Portfolio Analysis:

For our portfolio analysis we create three SIC (Standard Industrial Classification) based portfolios. They are:

1. Life insurance. (SIC 6311)
2. Property/Casualty insurance. (SIC 6331)
3. Other types of insurance. (SIC 6321, 6351 6361)

Schwert (1981) argues that individual asset returns of the firms in the same industry measured over a common time-period are contemporaneously correlated because the firms will react similarly to any unanticipated event. So in events such as regulatory changes the residuals will not be independently and identically distributed. If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, SUR model estimates will be more efficient than Ordinary Least Squares

(OLS). Thus, in order to test for hypotheses surrounding the events we estimate the following model using SUR methodology:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^3 \beta_{ij} Rm_{t+j-3} + \sum_{j=1}^3 \beta_{ij}' DRm_{t+j-3} + \delta_i Rr_t + \kappa_i Rf_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it} \quad (1)$$

Here, R_{it} is the return on portfolio i ($i = (1, 2, 3)$, life insurance, property/casualty insurance and all other insurance) on day t and Rm_t is the return on the market index at day t .⁸ D_{kt} is a dummy variable that is equal to 1 over the event window of the k th announcement and zero otherwise, γ_{ik} is the coefficient of a dummy variable that captures the impact of the k th event on the i th portfolio. D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise. Rf_t represents the return on a foreign exchange index on day t , Rr_t represents the return on a one-year T-bill on day t , and β'_{i1} , β'_{i2} , and β'_{i3} capture the shift in exposure to systematic risks between the pre-act and post-act period for portfolio i .

Based on the above model we test two hypotheses. The first statistically tests whether all of the announcements analyzed in this paper have a non-zero impact on the insurance industry. Formally this test is:

$$\gamma_{ik} = 0 \forall i, k \quad (2)$$

We do not expect that two lines of business in the insurance industry are going to have the same impact at each of the announcements. We formally test this using the following hypothesis test.

$$\gamma_{ik} = 0 \forall i \quad (3)$$

⁸ Lagged values of market return are used to overcome the effects of nonsynchronous trading in the sample.

We modify the above model to estimate the overall gain of each line of business from the passage of the GLBA and to test for the winners and losers in the insurance industry from this law.

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^3 \beta_{ij} Rm_{t+j-3} + \sum_{j=1}^3 \beta_{ij}' DRm_{t+j-3} + \delta_i Rr_t + \kappa_i Rf_t + \gamma_i DG + e_{it} \quad (4)$$

Here, the coefficient (γ_i) of the dummy variable DG estimates the overall impact of the law on each of the portfolios. This estimation allows us to formally test for evidence that no two lines of business in insurance industry have the same overall impact. Using the following hypothesis test in conjunction with the point estimation from equation 4 of overall impact, allows us to test hypothesis 2.

$$\gamma_i = \gamma_j \forall i, j \quad (5)$$

3.4.3 Specification test

We use a Likelihood Ratio (LR) test as suggested by Berndt and Savin (1977), to determine whether SUR estimates are more efficient than OLS estimates for our portfolio model.⁹

⁹ This test in principal determines whether the off-diagonal elements of the *variance covariance matrix* (Σ) of error terms are zero or not. Excluding the diagonal elements, there are $1/2m*(m-1)$ unknown parameters in Σ that can be arranged in a vector, θ . Here m is the number of equations. The null hypothesis is:

$$H_0: \theta = 0$$

This test is based on the following statistic:

$$\lambda_{LR} = T \left[\sum_{i=1}^m \log \hat{\sigma}_i^2 - \log |\hat{\Sigma}| \right]$$

here $\hat{\sigma}_i^2$ is $e_i' e_i / T$ from the individual least squares regression and $\hat{\Sigma}$ is the maximum likelihood estimator of Σ . This statistic has a limiting χ^2 distribution with $1/2m*(m-1)$ degrees of freedom under the null hypothesis.

3.5 Data and Event Selection

3.5.1 Firm Selection

We use the SIC classifications from COMPUSTAT to create our portfolios. The return information for this study comes from the CRSP tapes, while the balance sheet information comes from COMPUSTAT.

Table 1: Descriptive statistics of sample.

		Life Insurance	Property/Casualty	All Other Insurance
		n = 29	n = 77	n = 34
Total Asset Value (Millions of \$)	Mean	61767	7757	8071
	Median	8816	1593	1153
	Minimum	81	36	16
	Maximum	463696	150632	122237
Return on Equity	Mean	9.38	6.89	11.79
	Median	9.72	8.83	12.32
	Minimum	-8.97	-89.34	-10.70
	Maximum	15.79	28.03	27.15

We require firms have no missing trading data from August 1998 to March 2000. In order to match firms from COMPUSTAT and CRSP, we dropped all firms with exchange code 4 through 10, since CRSP only has return information for firms trading on the NYSE, AMEX and NASDAQ. We require the firms to have balance sheet information for both 1998 and 1999. Our final sample has 140 firms; the descriptive statistics are presented in table 1.

We use returns data for the sample firms from January 1990 to December 2000 to estimate of our models.¹⁰ Longer estimation windows are used for three reasons. First, Congress has debated the deregulation of the financial services industry at least 3 times in

¹⁰ We also estimate all the models presented in this paper using data from January 1998 to December 2000, as suggested by one of the referees, the major conclusion of the paper remains same.

the past decade.¹¹ Second, several deregulations took place in the 90's.¹² Finally, other major macroeconomic events took place during the 90's that may have had an impact on the financial services industry.¹³

3.5.2 *Macroeconomic variables*

Data for the two macroeconomic variables that we use in our study is obtained from the Board of Governors of the Federal Reserve System.¹⁴ For foreign exchange data, we use the *Major Currencies Index*¹⁵. The return is calculated using the following formula:¹⁶

$$Rf_t = \frac{F_t - F_{t-1}}{F_{t-1}} \quad (6)$$

To be consistent with previous literature we use the one-year T-bills rate as a proxy for the interest rate.¹⁷ Interest rate returns are computed using the formula,¹⁸

¹¹ The first time in 1995, Rep. Jim Leach introduced the banking modernization bill. The second time, the financial modernization bill died in congress due to strong opposition from the insurance industry. Finally, in 1998, the House version of the modernization bill passed but died in the Senate.

¹² Office of Thrift Supervision (OTS) allowed thrifts to branch where they choose in 1992. The Riegle-Neal Interstate Banking and Branching Efficiency Act sanctioned interstate banking and loosened interstate branching in 1994. In 1995, the U.S. Supreme Court ruled that banks can sell annuities and in the same ruling, the OCC was allowed to grant subsidiary powers to banks. In 1996, the Fed raised the Section 20 revenue cap from 10 percent to 25 percent, and banks were allowed to merge with large securities companies. Some banks immediately took advantage of that to acquire securities firms. OCC's 'First Union Letter' further opened national banks insurance power and the Fed eliminated section 20 firewalls in 1997. The three existing firewalls that were eliminated in 1997 were the restriction on interlocks between the Section 20 subsidiary and its affiliate banks/ thrift, the prohibition on cross-marketing between a bank and its securities affiliate and the exception to prohibition on the purchase or sale of assets between a bank and its securities affiliate.

¹³ The U.S. financial industry had been rocked by crises at home, like the LTCM (1998) crisis, and abroad, for example, the Asian Crisis (1997) or the Russian Crisis (1998).

¹⁴ All the information is available online from <http://www.federalreserve.gov>

¹⁵ The major currencies index is a weighted average of the foreign exchange values of the U.S. dollar against a subset of currencies in the broad index that circulate widely outside the country of issue. The weights are derived from those in the broad index.

¹⁶ From Wetmore and Brick (1994), and Choi, Elyasiani and Kopecky (1992).

¹⁷ See Kane and Unal (1988), Flannery and James (1984), and Wetmore and Brick (1994).

¹⁸ Also from Wetmore and Brick (1994)

$$Rr_t = \frac{R_t - R_{t-1}}{R_{t-1}} \quad (7)$$

3.5.3 Event Selection

Binder (1985b) argues that selection of event dates in regulatory events is much more difficult than standard studies that concern corporate announcements. Thirteen major events are identified from the Wall Street Journal and Lexis-Nexis wire service.

Table 2 summarizes the important events.

Table 2: Time line of the Gramm-Leach-Bliley Act.

Note: The first column 'Date' is the event date. If the event occurred after the trading closed for a day then that the next trading day is the event date. Event Window is defined as Event Date, -1 day and +1 day. The second column 'Event' describes the main event.

Date	Event
11/4/98	1. (i) Senator Alfonse D'Amato lost his re-election bid (11/03/98 –night). (ii) Senator Gramm to take over as a chair of Senate Banking Committee. (11/04/98).
1/8/99	2. Financial Services Reform Bill is reintroduced in Congress.
2/17/99	3. Draft bill was unveiled in the Senate.
4/12/99	4. Senator Gramm meets with Senate Minority leader to work on the bill.
4/28/99	5. Senate Banking Committee formally files the Financial Services Modernization Act in the Senate.
5/4/99	6. Clinton raises the privacy issue to be included in the bill.
05/06/99 – Midnight	7. Senate passes S. 900. Senate version of the Bill is passed.
7/1/99	8. House version of the bill was passed.
10/15/99	9. Federal Reserve and Treasury announce agreement on the regulation.
10/22/99	10. Gramm makes deal with White House on CRA.
11/02/99	11. Joint House Conference report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.
11/4/99	12. Senate passes the bill (90-8) and House passes the bill (362-57).
11/12/99	13. President Clinton signs the bill into law.

Table 3: Estimation of Overall impact of the law.

We estimated the following model to test for the overall impact of the law on each industry:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^3 \beta_{ij} Rm_{t+j-3} + \sum_{j=1}^3 \beta_{ij}' DRm_{t+j-3} + \delta_i Rr_t + \kappa_i Rf_t + \gamma_i DG + e_{it}$$

R_{it} is return on portfolio, $i(=1,2,3)$ on day t . Rm_t is Return on market index at time t . α_i is the intercept coefficient for portfolio i . $\beta_{i1}-\beta_{i3}$ are market risk coefficient for portfolio i . $\beta_{i1}'-\beta_{i3}'$ captures the difference in the exposure to systematic market risk between pre-act and post-act for portfolio i , δ_i is foreign exchange risk coefficient for portfolio i and κ_i is the interest rate risk coefficient for portfolio i . D_{kt} is a dummy variable which is equal to 1 on the event windows and zero otherwise, while D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise. e_{it} are the random disturbances. In this model coefficient of DG s i.e., γ_i estimates the overall average abnormal return of the law for the i^{th} portfolio.

Parameter	Life Insurance		Property/Casualty Insurance		All other Insurance	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
α	-0.001	-0.306	0.006 **	2.067	0.005	1.329
α'	0.001	1.328	0.002 ***	4.076	0.001 *	1.690
β_1	-0.024	-1.021	0.022	1.208	-0.031	-1.295
β_2	0.010 ***	4.156	0.083 ***	4.572	0.147 ***	6.049
β_3	1.057 ***	44.602	0.796 ***	43.841	0.766 ***	31.576
β_1'	0.001	0.027	-0.119 ***	-3.382	-0.063	-1.349
β_2'	-0.213 ***	-4.663	-0.339 ***	-9.699	-0.257 ***	-5.494
β_3'	-0.486 ***	-10.615	-0.204 ***	-5.827	-0.306 ***	-6.532
γ	0.004 **	2.218	0.006 ***	4.237	0.003 *	1.660
δ	0.000	0.417	-0.001 **	-2.444	0.000	-1.178
κ	0.000	-0.296	0.000	0.933	0.000	-0.599
R^2	0.451		0.474		0.307	
N	38		89		42	

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Table 4: Test that no two industries have same overall impact from the law.

Column 2 of this table presents the Wald test that two industries have same overall impact from the law. The underlying distribution is a χ^2 with 2 degrees of freedom.

Hypothesis	$\chi^2(2)$
Overall Impact of the law is same for Life and Property/Casualty Industry	17.950***
Overall Impact of the law is same for Life and all other Industry	6.516**
Overall Impact of the law is same for Property/Casualty and all other Industry	18.033***

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

3.6 *Empirical Results*

3.6.1 *Overall impact of the law*

Table 3 presents the results from estimation of the overall impact of the law (average impact of the law over the 13 event windows). Property/casualty has an average abnormal return (AR)¹⁹ of 0.6% (significant at 1% level) compared to that of 0.4% (significant at 5% level) for life insurance. The portfolio of all other insurance firms has an average abnormal return of 0.3% (significant at 10%). We also perform a chi-squared test (equation 5) to determine if the point estimates of average returns of any two industries are the same. These results are given in Table 4. The first null hypothesis that overall impact of the law is the same for the life and property/casualty insurance industries is rejected at the 1% level. The results also indicate that the impact of the law is significantly different across the life insurance and all other insurance industries (at the 5% level), as well as across the property/casualty industry and all other insurance industries (at the 1% level). These results lend support to our second hypothesis.²⁰

3.6.2 *Specification Test*

The result of the specification test for our portfolio model shows that the null hypothesis $H: \theta = 0$ is rejected at the 1% level. This means that the variance-covariance matrix is non-diagonal. Statistically that means that SUR is the correct model to choose as opposed to the OLS.

¹⁹ We call it average abnormal return because it is cumulative abnormal return over 13 events over the number of days in the event window (e.g., a 3 day event window over 13 events is the cumulative abnormal return over 39 days). We also estimate this model for 2 day [-1,0] event window and the results remain similar.

²⁰ We also estimate the same model using data from January 1998 to December 2000 and perform the same χ^2 test based on the estimation and reach the same conclusion.

3.6.3 *Hypotheses based on portfolio analysis*

The main advantage of using the Seemingly Unrelated Regression methodology is the ability to do joint hypothesis testing. The following hypothesis tests are based on the estimation of the portfolio model (presented in Table 5). Here we will test two different hypotheses.

First we test that all 13 events have zero impact on the insurance industry. This test is based on equation 2. This hypothesis examines all events to determine whether the average abnormal returns (all 39) are jointly equal to zero. The distribution under the null hypothesis is $\chi^2(39)$. The hypothesis is rejected at the 1% level (calculated value is 85.1).

Panel A of Table 5 presents the SUR estimation results, average abnormal returns and corresponding t-statistics for each of the 13 events for the three portfolios. It also presents model parameter estimates for the market betas (current and lagged), shift in market betas, foreign exchange risk coefficient (δ) and interest rate risk coefficient (κ). We find that current and lagged market betas are positive and significant at the 1% level for all three portfolios. The foreign exchange risk coefficient is significant for property/casualty insurance. Coefficient of β'_3 (the risk shift parameter) is negative and significant (at the 1% level) for all lines of insurance business. This implies that exposure to systematic risk was reduced after the enactment of GLBA. As discussed earlier this shift may have arisen from the diversification benefits, from safeguards against excessive risk taking, or due to a combination of both these effects. Panel B presents the results of the hypothesis test that all the portfolios have the same impact due to an announcement.

Table 5: Estimation of a modified market model with 3 sub-portfolios of the insurance industry and test of hypothesis that two lines of business is going to have similar impact on the same announcements.

The following table presents the estimation results of portfolio model:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^3 \beta_{ij} Rm_{t+j-3} + \sum_{j=1}^3 \beta_{ij}' DRm_{t+j-3} + \delta_i Rr_t + \kappa_i Rf_t + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it} \quad i=\{1,2,3\}$$

R_{it} is return on portfolio, i on day t . Rm_t is Return on market index at time t . α_i is the intercept coefficient for portfolio i . $\beta_{i1}-\beta_{i3}$ are market risk coefficients for portfolio i . $\beta_{i1}'-\beta_{i3}'$ captures the difference in the exposure to systematic market risk between pre-act and post-act for portfolio i , δ_i is foreign exchange risk coefficient for portfolio i and κ_i is the interest rate risk coefficient for portfolio i . D_{kt} is a dummy variable which is equal to 1 in the event window of k th announcement and zero otherwise, while D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise. e_{it} are the random disturbances. In this model the coefficient of D_{kt} s i.e. γ s estimates the AR over the event window. Panel A presents the average abnormal return and t-statistics for each of the thirteen events, as well as the model parameter estimates for the market betas (current and lag), foreign exchange risk coefficient and interest rate risk coefficient. Panel B presents the results of hypothesis that two lines of business have same impact on the same announcements. N represents the number of firms in each of the portfolios.

Parameter	Panel A						Panel B
	Life Insurance			Property/Casualty Insurance		All other Insurance	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	$\chi^2(3)$
α	-0.001	-0.323	0.006	2.098	0.005	1.384	
α'	0.001	1.333	0.002 ***	4.113	0.001 *	1.725	
β_1	-0.021	-0.879	0.026	1.428	-0.032	-1.301	
β_2	0.104 ***	4.379	0.086 ***	4.702	0.149 ***	6.104	
β_3	1.055 ***	44.681	0.795 ***	43.899	0.766 ***	31.580	
β_1'	-0.002	-0.045	-0.123 ***	-3.507	-0.063	-1.344	
β_2'	-0.218 ***	-4.796	-0.342 ***	-9.797	-0.258 ***	-5.536	
β_3'	-0.484 ***	-10.632	-0.204 ***	-5.827	-0.305 ***	-6.538	
δ	0.000	0.443	0.001 ***	-2.465	0.000	-1.231	
κ	0.000	-0.336	0.000	0.885	0.000	-0.616	
γ_1	-0.002	-0.374	0.000	-0.079	0.007	1.142	1.712
γ_2	0.000	-0.061	-0.002	-0.586	-0.014 **	-2.468	6.266 *
γ_3	0.022 ***	3.982	0.011 ***	2.671	0.005	0.950	16.384 ***
γ_4	0.000	0.050	-0.001	-0.202	0.006	1.114	1.620
γ_5	-0.007	-1.252	0.010 **	2.349	0.010	1.717	14.916 ***
γ_6	-0.001	-0.145	0.008	1.529	0.004	0.565	3.526
γ_7	0.002	0.325	0.012 **	2.321	0.002	0.278	6.644 *
γ_8	0.008	1.224	0.000	-0.050	0.000	0.015	2.124
γ_9	0.008	1.492	0.004	0.840	0.000	-0.029	2.361
γ_{10}	0.013 **	2.431	0.012 ***	2.749	0.009	1.642	9.530 **
γ_{11}	-0.010	-1.496	-0.001	-0.167	0.004	0.637	3.336
γ_{12}	0.012 *	1.770	0.018 ***	3.497	-0.002	-0.286	14.514 ***
γ_{13}	-0.005	-0.525	0.006	0.856	0.008	0.837	2.382
R^2	0.456		0.479		0.311		
N	38		89		42		

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Three events produce significant average abnormal returns (AR) for the life insurance industry. When the draft bill is unveiled in Senate on February 17, 1999, life insurance has an AR return of 2.2% (significant at the 1% level). When Senator Phill Gramm (Chairman of Senate Banking Committee) agreed with the White House on the CRA provision on October 22, 1999, the AR is 1.3% and it is significant at the 5% level. Finally, when the Senate and House pass the bill, the life insurance portfolio has a positive AR of 1.2%, significant at the 10% level.

The property/casualty insurance industry has significant stock price reactions on the same events as that of life insurance. When the draft bill is unveiled, the portfolio of life insurance firms has an AR of 1.1% (significant at 1%), when Senator Gramm agrees with the White House on CRA provision the AR is 1.2% (significant at 1%) and when the Senate and House pass the bill it has a 1.8% AR (significant at 1%). In addition, the property/casualty insurance industry has a significant stock market reaction on two other occasions. The first of these is when the Senate Banking Committee formally files the Financial Services Modernization Bill to the Senate. On this occasion, the property/casualty portfolio has a 1.0% AR, significant at the 5% level. This insurance portfolio also has a 1.2% AR (significant at 5%) when the Senate passed Senate version of the bill (S. 900).

The portfolio of other insurance firms has a negative reaction on one event. This is when the Financial Services Reform Bill is reintroduced in the Congress. The AR in this occasion is -1.4% (significant at the 5% level).

Panel B of Table 5 presents the Wald test of the hypothesis presented by equation 3 for each announcement. This tests the hypothesis that the information produced during

the k^{th} event has the same impact over all three portfolios. We find that over six different events the impact of the announcement has an asymmetric impact across the three portfolios. They are events 2 (Financial Services Bill was re-introduced in Congress), 3 (Draft Bill is unveiled in Senate.), 5 (Senate banking committee formally files the bill.), 7 (Senate passes S. 900 (Senate version of the Bill)), 10 (Senator Gramm makes a compromise with The White House on the CRA.) and 12 (Senate and House pass the bill).

3.7 Cross Sectional Analysis

The GLBA creates positive and significant wealth effects for some firms and negative but significant effects for others. Other firms may have statistically insignificant wealth effects from the passage of the GLBA. The general purpose of a cross-sectional analysis is to identify firm-specific characteristics that will help us to single out winners and losers from this law. Specifically, our goal is to test for hypothesis 3, 4 and 5.

In order to identify the firm-specific characteristics, we first need to generate the overall AR for each firm. We use equation 4 to generate the wealth effects (i.e. η_i for firm i gives the right hand side variable).

$$\begin{aligned}
 AR_i = & \theta + \theta_{LIFE}LIFE + \theta_{OTHERS}OTHERS + \\
 & + \theta_{SIZE}SIZE + \theta_{SIZE \times LIFE}(SIZE \times LIFE) + \theta_{SIZE \times OTHERS}(SIZE \times OTHERS) \\
 & + \theta_{ROE}ROE + \theta_{ROE \times LIFE}(ROE \times LIFE) + \theta_{ROE \times OTHERS}(ROE \times OTHERS) \\
 & + \theta_{RISK}RISK + \theta_{RISK \times LIFE}(RISK \times LIFE) + \theta_{RISK \times OTHERS}(RISK \times OTHERS) + \xi
 \end{aligned} \tag{8}$$

Here θ is the intercept for property/casualty insurance firms, the difference in coefficient estimate of intercept for life insurance firms with property/casualty insurance firms is θ_{LIFE} and the difference in coefficient estimate of intercept for other insurance firms with property/casualty insurance firms is θ_{OTHERS} . The Size variable is calculated by

taking the log of book value of total assets. ROE is a profitability indicator, defined as net income after taxes as a percent of book value of equity capital. RISK is the change in exposure to systematic risk, which we estimate using equation 4 (β'_{i3}). θ_{SIZE} is the coefficient estimate of size for property/casualty insurance, while $\theta_{SIZE \times LIFE}$ is the difference in coefficient estimate of size variable for life insurance firms with property/casualty insurance and $\theta_{SIZE \times OTHERS}$ is the difference in coefficient estimate of size variable for other insurance firms with property/casualty insurance. The coefficient estimates for ROE and SHIFT are defined likewise.

We estimate equation 8 using the OLS method. The result of the estimation is presented in table 6; the t-statistics are computed using the formulas suggested by MacKinnon and White (1985). We expect *SIZE* variable to be positive and significant. Coefficient for *SIZE* variable of the reference group (property/casualty insurance) is positive and significant at 1% level. While the difference in coefficient estimates of the size variable for life insurance firms and other insurance firms from the reference group is insignificantly different from zero. Thus we find that, consistent with the hypothesis, larger firms in the insurance industry, irrespective of the business line, gain from the GLBA.

Prior merger literature concludes that poorly performing firms become merger targets. Previous researcher also predict that banking firms may benefit from mergers with life and property/casualty insurance. Thus we expect that poorly performing firms, especially the ones in the life and property/casualty insurance business will benefit more. The results in Table 6 show that the coefficient estimate of ROE for the reference group is negative and significant and the difference in the coefficient estimate for life insurance

is insignificantly different from zero. These results are consistent with the hypothesis. But we find that the difference in the coefficient estimate for other insurance firms is positive and significant.

Table 6: Cross-sectional analysis of wealth effect on each firm in the insurance industry.

The models are:

$$\begin{aligned}
 AR_i = & \theta + \theta_{LIFE} LIFE + \theta_{OTHERS} OTHERS + \\
 & + \theta_{SIZE} SIZE + \theta_{SIZE \times LIFE} (SIZE \times LIFE) + \theta_{SIZE \times OTHERS} (SIZE \times OTHERS) \\
 & + \theta_{ROE} ROE + \theta_{ROE \times LIFE} (ROE \times LIFE) + \theta_{ROE \times OTHERS} (ROE \times OTHERS) \\
 & + \theta_{RISK} RISK + \theta_{RISK \times LIFE} (RISK \times LIFE) + \theta_{RISK \times OTHERS} (RISK \times OTHERS) + \xi
 \end{aligned}$$

Both models are estimated using OLS. Here AR_i is the abnormal return of firm i . ξ is the error term in the regression. θ is the intercept for property/casualty insurance firms, the difference in coefficient estimate of intercept for life insurance firms with property/casualty insurance firms is θ_{LIFE} and for other insurance firms with property/casualty insurance firms is θ_{OTHERS} . $SIZE$ variable is calculated by taking book value of total asset. ROE is a profitability indicator, defined as net income after taxes as a percent of book value of equity capital. $RISK$ is the change in exposure to systematic risk, which we estimate using equation 4 (β'_{i3}). θ_{SIZE} is the coefficient estimate of $SIZE$ for property/casualty insurance, while $\theta_{SIZE \times LIFE}$ is the difference in coefficient estimate of $SIZE$ variable for life insurance firms with property/casualty insurance and $\theta_{SIZE \times OTHERS}$ is the difference in coefficient estimate of $SIZE$ variable for other insurance firms with property/casualty insurance. The coefficient estimates for ROE and $SHIFT$ are defined likewise.

Parameter	Estimate	t-statistic
θ	-0.288 **	-2.587
θ_{LIFE}	0.204	0.997
θ_{OTHERS}	0.130	0.829
θ_{SIZE}	0.046 ***	3.563
$\theta_{SIZE \times LIFE}$	-0.026	-1.202
$\theta_{SIZE \times OTHERS}$	-0.026	-1.333
θ_{ROE}	-0.003 ***	-4.485
$\theta_{ROE \times LIFE}$	0.009	1.117
$\theta_{ROE \times OTHERS}$	0.009 ***	4.441
θ_{RISK}	-0.177 **	-2.252
$\theta_{RISK \times LIFE}$	0.471 **	2.356
$\theta_{RISK \times OTHERS}$	0.073	0.545
R^2	0.355	
F	6.209 ***	

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

We expect that the merger opportunities will create diversification benefits that will reduce the exposure to market risk for the firms in the insurance industry. In addition, the GLBA also reduces risk by providing safeguards against excessive risk-

taking. For both these reasons, we expect that risk reduction will account for a part of the wealth effect. We find that for the reference group the coefficient estimate for risk is negative and significant but for firms in the life insurance the difference in coefficient estimate is positive and significant. For all other insurance firms the difference in estimate is insignificant. So shareholders of property/casualty insurance as well as other insurance firms (except life insurance firms) benefit from the diversification and new measures included in GLBA which safeguards against excessive risk-taking.

3.8 Conclusion

In this paper, we examine the impact of Financial Services Modernization Act of 1999 on the insurance industry. Our sample includes 140 firms from the insurance industry. We analyze 13 different announcement dates that were related to the passage of the GLBA. We study several different issues including characterizing the winners and losers from the passage of this law at both the industry level and the firm level.

This study has two major contributions. First, previous studies consistently find that the GLBA creates wealth effects for the insurance industry, but none of these studies investigate whether some lines of business within the insurance industry may benefit more than others. We find that property/casualty and life insurance firms gain more from the deregulation compared to other firms in the insurance business. We also show that this gain can be explained by their suitability as targets to banking conglomerates. Secondly, we show that diversification opportunities and safeguards against excessive risk-taking under the GLBA reduces exposure to systematic risk for all business lines in the insurance industry and creates value for the shareholders of property/casualty firms and the portfolio of other firms (except life insurance firms).

In addition we also test a merger related hypothesis. We find strong evidence that large firms, irrespective of business lines, gain from the passage of this law. We also find that poorly performing firms in both the property/casualty and life insurance industries gain from the deregulation.

3.9 References

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Chapter IV

Implications of Gramm-Leach-Bliley Act for International Banking

4.1 Abstract

The purpose of this paper is to investigate the impact of the Gramm-Leach-Bliley Act (GLBA) on international banks. We find that the banking sectors of most developed countries have significant negative spillover effects from the GLBA. We also find that the impact of the GLBA on any two countries' banking sectors is not the same. Most importantly we show that exposure to systematic risk with respect to world equity index has increased following the passage of the GLBA and this can explain the cross-sectional variation of the wealth effects. This result implies that the GLBA reduced diversification opportunities for foreign banks by restricting their operations in the U.S., the most important banking market. In cross-sectional analysis we also find, consistent with previous literature, that wealth effect can be partially explained by country-specific dummy variables.

4.2 Introduction

The Gramm-Leach-Bliley Act (GLBA) of 1999 is potentially the most significant legislation of the past century because it changes the way financial institutions conduct their business in the U.S. However, predictions have been made, in the academic and

professional literature, that the GLBA will have a widespread impact on international banking as well. Some argue that the GLBA will induce more cross-country mergers while others argue that the GLBA will create growth opportunities for international banks in the U.S. In a recent study, Carow and Heron (2002) analyze the impact of this regulation on ten publicly traded international banks in the U.S. They find that the return on a portfolio of international banks trading in the U.S.A is more negative compared to that of publicly traded U.S. banks following the passage of the GLBA. Our study complements that of Carow and Heron (2002) and broadens it to investigate the impact of the GLBA on 215 international banks from 10 developed countries. We also seek to answer whether the GLBA has created any diversification opportunities for international banks. Finally, we try to predict whether the GLBA will encourage increases in foreign bank presence, growth and entry in the United States.

This study focuses on three important questions; first, does the GLBA create growth opportunities for foreign banks in the U.S. It is argued in the literature that this act creates significant growth opportunities for international banks and there is a growing trend of non-U.S. banks acquiring U.S. banks. Berger et al. (2000) document a trend in acquisitions of U.S. firms by non-U.S. firms. By the mid-90s the total value of these consolidations was \$10 billion and by 1998, more than \$12 billion. Historically, any increase in the activity of foreign banks in the U.S. has created political pressure on regulators to restrict their growth. For example, Goldberg and Saunders (1981) notes that rapid growth in foreign banks in the U.S. in the early 70s led to the restriction of multi-state operations of all foreign banks and subsequently led to the International Banking Act of 1978. The second question we address is whether the impact on foreign banks

varies across countries, bank size, profitability and presence in the U.S. We investigate this question because literature on foreign bank activity in the U.S. predicts that the impact of the GLBA will be different from one country to the other and the literature that investigate the impact of the GLBA on domestic banks find that size and profitability can explain the cross-sectional variation of the wealth effect.

Finally, we investigate if the GLBA creates diversification opportunities for international banks and thereby reduces exposure to systematic risk. Correlations of bank earnings presented in Table 1 show very strong diversification opportunities for international banks in the U.S., as argued by Berger et al. (2000). We inquire whether the GLBA allows international banks to take advantage of this opportunity as suggested by Finch, Macdonald and Walker (2000) and thereby reduce the exposure to systematic risk.

Table 1: Correlation of bank earnings between USA and selected G-10 and EU countries between 1988 and 1997.

	Canada	Denmark	France	Germany	Greece	Italy	Japan	Spain	Switzerland	UK	USA
Canada	1.000										
Denmark	0.648	1.000									
France	-0.344	-0.229	1.000								
Germany	0.129	0.500	-0.513	1.000							
Greece	-0.705	-0.279	0.084	0.394	1.000						
Italy	-0.391	-0.455	0.803	-0.264	0.170	1.000					
Japan	-0.320	-0.563	0.259	0.098	0.202	0.733	1.000				
Spain	-0.085	-0.195	0.782	-0.522	0.089	0.498	0.088	1.000			
Switzerland	-0.275	-0.246	0.155	0.107	0.309	0.310	0.301	-0.138	1.000		
UK	0.592	0.689	-0.734	0.446	-0.169	-0.854	-0.708	-0.431	-0.426	1.000	
USA	0.413	0.399	-0.880	0.258	-0.329	-0.938	-0.603	-0.702	-0.336	0.811	1.000

Source: 'Bank Profitability': OECD Publications 1999 and 2000.

Our study concentrates on large international banks because the literature on international spillover effect predicts that larger banks are affected from international

events. In this study we analyze 215 foreign banks from 10 countries, of which 7 are EU member countries (France, Denmark, Germany, Greece, Italy, Spain and the UK) and 3 are non-EU countries (Canada, Japan and Switzerland). We have also included 45 large U.S. banks in this study. We find that most of the foreign banking industries have a significant impact from the events leading to the passage of the GLBA. Banking industries of 6 (Canada, Denmark, Germany, Greece, Japan, and Spain) out of the 10 countries that we investigate have a significantly negative impact, while the banking industries of France, Italy and the UK are largely unaffected by this regulation. We find that the cross-sectional variation in firm specific wealth effect is partly attributable to country specific events and attributes during that period.

The most important contribution of this paper is that we identify that the GLBA has increased international banks' exposure to systematic risk, with respect to a world index. The GLBA has reduced the capability of international banks to diversify their portfolio by restricting their entry and expansion to the U.S. market.

The rest of the study is organized as follows: the second section provides a literature review. Section three briefly discusses the GLBA and its implication for international banks. Section four introduces our major hypotheses. Section five describes the methodology, data and lists the major events. Section six presents the empirical results and a final section concludes.

4.3 Literature

4.3.1 Literature on the impact of GLBA on domestic Financial Institutions

Hendershott, Lee, and Tompkins (2002) investigate the market response of the GLBA on the three major financial industries. They do not find any market response for

commercial banks, while they find a significantly positive wealth effect for both the insurance and brokerage industries, though only for one event. They argue that loopholes in the laws have long allowed banks to have a ‘fairly substantial presence in other sectors’ as a reason to why there is no wealth effect for commercial banks. For all three industries they find that the size of the firms can explain the cross-sectional variation of the wealth effect and for commercial banks they also find that profitability can explain the cross-sectional variation in return. Similarly, Carow and Heron (2002) find that brokerage firms and insurance companies benefit from the GLBA, but banks do not benefit. They also find negative returns for foreign banks, thrifts, and finance companies; though larger non-depository firms have higher returns. Akhigbe and Whyte (2001), on the other hand, find that all three industries benefit from the provisions of GLBA and that larger and well-capitalized banks benefit more from this law. They also find that brokerage firms benefit regardless of size, but the gains are inversely related to capital position, and insurance companies benefit regardless of size and capitalization. Barth, Brumbaugh, and Wilcox (2000) argue that the GLBA is just ratifying the "Status-quo" rather than being revolutionary, and that this law is more in favor of larger banks and financial institutions.

4.3.2 Literature on international spillover effects

There is evidence in the literature of international spillover effects that predict that the impact of the GLBA will not be limited to the U.S. financial services industry. Bruner and Simms (1987) examine the reaction of U.S. banks to Mexico’s loan crisis and find that U.S. banks have negative wealth effect to the news. Musumerci and Sinkey (1990) find that Brazil’s announcement of a debt moratorium in 1987 had a negative impact on

the U.S. money center banks. Madura, Whyte and McDaniel (1991) find that Citicorp's announcement of a significant increase in loan-loss reserves in 1987 had a significantly negative impact on British banks. In all of the above cases the exposure of banks to less developed countries are identified as the reason for the negative reactions.

4.3.3 Cross boarder consolidation and risk expected return tradeoffs

The available empirical research suggests that at least some types of cross-border consolidation can improve the risk-expected return tradeoff. The literature on commercial banks in the U.S. generally find that larger, more geographically diversified institutions tend to have better risk-expected return tradeoffs (e.g. Macclister and McManus (1993), Hughes, Lang, Mester, and Moon (1996, 1999), Hughes and Mester (1998) and Demsetz and Strahan (1997)), while Cummins and Weiss (2000) find that international diversification can improve both the risk-expected return tradeoff and profit efficiency for the insurance industry.

4.3.4 Literature on the determinants of foreign bank presence, activity and growth

Grosse and Goldberg (1991) investigate the foreign banking activity in the United States by country of origin. Their results show that foreign investment (FDI and foreign portfolio investment) into the United States, bilateral trade, and the size of each countries' banking sector (demand deposits and time deposits) are positively correlated with that countries' bank presence in the U.S. Hultman and McGee (1989) find that foreign presence of U.S. bank subsidiaries are directly related to FDI and exchange rate, and inversely related to P/E ratios. They find the growth of foreign bank branches and agencies in the U.S. is directly related to FDI, exchange rate and the passage of International Banking Act (IBA) of 1978. Goldberg and Saunders (1981) show that

important determinants in foreign banks' growth in the U.S. are the size of interest differentials between U.S. and foreign deposits and loans, the falling P/E ratio for U.S. bank stocks, increased size of FDI, the persistent depreciation in the dollar and the expectation that the IBA of 1978 would have a restrictive effect on foreign banking activity in the U.S. Seth et al. (1998) show that one of the major determinants of financial institutions' growth abroad has been the parallel growth of foreign direct investment and foreign trade by globally oriented multinational corporations from the institutions' home country.

4.4 GLBA and the International Banks¹

Under the GLBA, international banks can engage in commercial banking, merchant banking and insurance in ways consistent with their business strategies. If the international bank becomes a Financial Holding Company (FHC) there is no limit to the revenue generated by its insurance activity, merchant banking activity or investment banking activity. To qualify as a FHC, it must notify the Federal Reserve about the activities in which it will engage and make certain required certifications of those activities. In order to become a FHC, its depository institution must be well capitalized and well managed; and no insured institutions within the FHC can have less than a satisfactory rating under the Community Reinvestment Act (CRA).

International banks have to decide whether they want to keep their current structure and continue to engage in current activities or to engage in other activities permitted under the new regulation. If international banks engage in traditional commercial banking in the U.S., via a branch or agency, they may still do so without

¹ Adapted from Finch, Macdonald and Walker (2000)

changing their structure. But if the U.S. branch or agency engages in certain securities, merchant banking or investment banking activities in the U.S., the operation has to cease (unless they are grandfathered²). Under the new regulation the activity, and not the entity, determines the primary supervisory authority.

Most international banks that engaged in significant insurance activities did so through a domestic bank or through an insurance subsidiary of a domestic bank. Now international banks must either operate via an existing licensed insurance subsidiary, or establish a new subsidiary and obtain a license from the state insurance department where they want to sell the insurance, to take full advantage of the opportunity provided by the new regulation.

Most of the international banks carry out their investment or merchant banking activities in U.S. through Section 20 investment subsidiaries. These banks can continue to engage in these activities so long as they are grandfathered, but they cannot engage in any new activities. Some of the international banks in the U.S. engage in investment banking through domestic bank and trust companies. These operations must cease under the new law. The GLBA requires international banks to engage in these activities through a U.S. registered broker dealer.

In order to engage in any activity in the U.S., an international bank must be well capitalized and well managed by the standards set by the FED. The FED will review worldwide operations of an international bank to determine whether they can engage in commercial banking, or any other activities in the U.S.

² Grandfathered means the bank may continue to engage in the activity because it did so before the restrictions became law. New activities are not covered by the grandfather provision.

4.5 Hypotheses

We test the following four major hypotheses.

Hypothesis 1: *GLBA will have significant spillover effects on international banks.*

We expect that banks in developed countries will have significant wealth effects due to the passage of the GLBA for three reasons. First, the literature on international spillover effects predicts that if the banking sector of a country has exposure to any foreign market, then an event in that foreign market can have spillover effects on the financial sector of that country. Any bank that wants to have international coverage has to have its operation in the U.S.³.

Table 2: Foreign Banks' Operation in U.S.: No of Banks, Revenue from U.S. Operation and FHC status of Foreign Banks

Country	No of Banks in USA in (9/98)	No of Banks in USA in (9/99)	Total Asset Booked in U.S. (9/98) \$million	Total Asset Booked in U.S. (9/99) \$million	No. of Banks claimed FHC status by November 30, 2001	Percentage of foreign Banks claiming FHC structure
Canada	6	6	122,524	125,095	6	100%
Denmark	2	2	-	-	1	50%
France	14	10	171,358	163,618	2	14%
Greece	1	1	-	-	0	0%
Germany	14	15	147,458	209,228	2	14%
Italy	17	15	31,013	26,355	0	0%
Japan	50	39	279,591	213,625	0	0%
Spain	5	5	17,651	20,319	1	20%
Switzerland	8	8	83,336	56,120	2	25%
UK	11	10	83,540	88,551	1	9%
All foreign Banks	320	284	1,162,669	1,126,516	21	7%

Source: Board of Governors Federal Reserve System.

³ Blanden (2000) claims that the "U.S. remains a magnet for foreign banks, with a presence in New York essential for any group with pretensions to international coverage".

Table 2 shows that all of the developed countries (included in this study) have exposure to the U.S. banking market. So we expect a spillover effect on the international banks from the GLBA.

Second, it is documented in the literature (Goldberg and Saunders (1981) and Hultman and McGee (1989)) that the IBA of 1978 influenced the growth of foreign banks in the U.S. Similarly, we argue that the GLBA may also impact the growth of foreign banks in the U.S.

Third, Berger et al. (2000) report a growing trend in international banks acquiring U.S. banks, which reflects the intention of foreign banks to establish their presence in the U.S. In the mid-90s the total value of such consolidations was \$10 billion (in 1998 dollars) and by 1998, that figure had increased to \$12 billion. One of the major reasons for such mergers is that at least some types of cross-border consolidation are likely to improve the risk-expected return tradeoff. Table 1 shows the correlation of bank earnings between the U.S. and banks in the countries included in this study from 1988 to 1997. The correlation of earnings with the U.S. is quite low and mostly negative, except with the UK. This data suggests very strong diversification possibilities and opportunities to improve the institutions' risk-expected return tradeoff through cross-border consolidation (Berger et al. (2000)). Given the diversification opportunities, added with the size of the market (of the U.S. banking industry), any major regulatory change in the U.S. banking industry should have spillover effects on international banks.

Hypothesis 2: *The banking industries of any two countries will not have the same impact from the GLBA.*

Studies that investigate foreign bank presence, activity and growth in the U.S. find that there are country specific characteristics like exchange rate, size of the source countries banking sector, P/E ratio and trade with the source country that can explain such activities. We argue that since such characteristics, and also exposure to the U.S. banking market, are not same for any two countries, the impact on any two countries' banking industry will not be the same from the GLBA.

Hypothesis 3: *The banking industry of developed countries will have negative wealth effects from the passage of the GLBA.*

The GLBA creates opportunities for international banks to engage in activities that were not possible under previous regulation. Under the GLBA, international banks have no revenue limits from any of its investment, merchant banking insurance or depository activities, when they choose to become a FHC. But these advantages are also available to local banks, insurance and securities firms. So for all the new opportunities, a foreign bank still has to compete with local firms who have “home field advantage”⁴ over the foreign firms. Thus we expect that international banks may have negative wealth effects from the passage of GLBA.

Under the new regulation, the insurance activities conducted by foreign banks through domestic banks and insurance subsidiaries of domestic banks have to cease. In addition, a portion of the investment and merchant banking activities conducted via domestic banks and trust companies must also be discontinued. International banks will be allowed to retain only the part of their investment and merchant banking activity (the most important operation in the U.S.) carried out through Section 20 investment

⁴ See Berger et al. (2000) for a detailed discussion of the *Home Field Advantage* hypothesis.

subsidiary, and will be restricted to those activities that are grandfathered. The same grandfathering provision applies to their traditional commercial banking activity. But for all the activities that are allowed, they will still have to comply the FED's capitalization and management standards for their U.S. operations, as well as their worldwide operations. In fact, the permissible activity of foreign banks will become more restricted under the GLBA unless foreign banks claim a FHC structure. To claim a FHC structure foreign banks must meet the FEDs capitalization and management standards for U.S. operations as well as worldwide operations. The capital adequacy and management standards set by the GLBA can also be a potential reason for negative wealth effects for foreign insurance firms. Carow and Heron (2002) argue that many countries impose lower capital requirements than the U.S., thus these eligibility requirements impose new costs for foreign banks that want to do business in the United States as a FHC, or in any other structure.

Hypothesis 4: *The GLBA will reduce the diversification opportunities for international banks and thereby increase risk for their stockholders.*

The GLBA will restrict the entry and expansion of international banks in the U.S. due to increased competition from the domestic participants in the U.S. banking industry who have home field advantage over the foreign banks. This restricts the scope of activities permissible to foreign banks, by restructuring the way certain business are carried out, and finally and most importantly, due to the FED's capitalization and management standards for U.S. operations as well as worldwide operations. For all of these reasons, the GLBA will reduce the opportunities for diversification of foreign banks in the most important banking market in the world.

Table 3: Descriptive statistics

Country	No. of firms	Three bank concentrations Ratio [¶]	Total Asset in 1999 [⊕]	ROE in 1999 [⊕]	Total no of Agencies in 1999***	Total no of Branches in 1999***	Total no of Representatives in 1999***	Total no of Subsidiaries in 1999***	No. of FHCs in 11/30/2001 ^ℵ	Export from U.S. 99* ^ℵ	Import to U.S. 99* ^ℵ
Canada	8	65.20%	\$106,498.89	14.60	3	2	0	1	6	\$166,600.00	\$198,711.10
Denmark	36	63.70%	\$197,443.91	9.12	0	1	0	0	1	\$1,725.60	\$2,818.70
France	18	63.60%	\$69,747.42	12.38	0	3	0	0	2	\$18,877.40	\$25,708.60
Greece	8	98.30%	\$16,701.70	25.57	0	0	0	0	0	\$995.50	\$563.10
Germany	11	89.50%	\$234,317.24	9.66	0	3	0	1	1	\$26,800.20	\$55,228.40
Italy	17	35.90%	\$62,000.18	12.13	0	6	2	0	0	\$19,436.60	\$8,475.00
Japan	73	28.30%	\$38,019,876.81	-10.87	1	14	6	0	0	\$57,465.70	\$130,863.90
Spain	15	50.10%	\$40,494.54	16.21	0	0	0	0	0	\$6,133.40	\$5,059.20
Switzerland	21	79.80%	\$57,467.31	8.29	0	2	0	1	2	\$8,371.30	\$9,538.60
UK	8	29.10%	\$243,770.56	21.32	0	4	0	0	1	\$38,407.10	\$39,237.20
USA	45	13.30%	\$66,903.15	1.22**					570		

*In millions of U.S. dollars

[⊕]Source: DataStream

**Source: Compustat

*** Source: The Banker March 1999

^ℵSource Board of Governors Federal Reserve System.

[¶]Barth, Nolle and Rice (2000)

This reduction in diversification benefits will increase risk for stockholders of international banks in the developed countries.

4.6 Data and Methodology

4.6.1 Data

This study mainly concentrates on banks from European Union (EU) for several reasons. First, the U.S. and the EU are frequently compared in the literature because they have roughly equal shares of world population and GDP. Secondly, the EU accounts for a larger share of the world's banking assets compared to that of the USA⁵. We include Japan because, until 1999, Japanese banks had the highest total banking assets in the United States and Japan has the most restricted financial services industry in the developed world. Canada is included because all of the Canadian Schedule 1 banks have large operations in the U.S. and Canada has control over a sizeable amount of assets in U.S. operations.

We test the above hypotheses using daily common stock returns over a period from January 1998 to December 2000. Daily stock returns and balance sheet information for large banks from Canada, Denmark, France, Germany, Greece, Italy, Japan, Spain, Switzerland, and the UK are obtained from the DataStream database and BankScope database. Daily stock returns for 45 large U.S. banks (over \$10 billion total assets in 1998) are obtained from the CRSP database.

⁵ See Barth, Nolle and Rice (2000).

Table 4: Time line of the Gramm-Leach-Bliley Act.

Note: The first column 'Date' is the event date. If the event occurred after the trading closed for a day then that the next trading day is the event date. Event Window is defined as Event Date, -1 day and +1 day. The second column 'Event' describes the main event.

Date	Event
11/4/98	1. (i) Senator Alfonse D'Amato lost his re-election bid (11/03/98 –night). (ii) Senator Gramm to take over as a chair of Senate Banking Committee. (11/04/98).
1/8/99	2. Financial Services Reform Bill is reintroduced in Congress.
2/17/99	3. Draft bill was unveiled in the Senate.
4/12/99	4. Senator Gramm meets with Senate Minority leader to work on the bill.
4/28/99	5. Senate Banking Committee formally files the Financial Services Modernization Act in the Senate.
5/4/99	6. Clinton raises the privacy issue to be included in the bill.
05/06/99 – Midnight	7. Senate passes S. 900. Senate version of the Bill is passed.
7/1/99	8. House version of the bill was passed.
10/15/99	9. Federal Reserve and Treasury announce agreement on the regulation.
10/22/99	10. Gramm makes deal with White House on CRA.
11/02/99	11. Joint House Conference report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.
11/4/99	12. Senate passes the bill (90-8) and House passes the bill (362-57).
11/12/99	13. President Clinton signs the bill into law.

Table 3 presents the distribution of firms across the countries, some firm specific information, information regarding bilateral trade with the U.S. and the home country, form of operation of these banks in the U.S. and concentration of the banking sector in the respective countries.

We identify 13 major events from the Wall Street Journal and Lexis-Nexis wire service. In Table 5 we summarize these important events.

4.6.2 Portfolio Analysis

First, we adapted the model used by Blinder (1985), then following Wagster (1996) we introduce long-term and short term interest rate to control for the interest rate risk. We also include return on exchange rate with the U.S. dollar because return on foreign investment will depend on return on the assets within its own market and changes in exchange rate. We then modify the model following Cornett and Tehranian (1990) and introduce the lagged value of the market index for possible nonsynchronous trading effects. We use dummy variables to identify the major events that led to the passage of the GLBA. The dummy variable is equal to 1 over each event window and zero otherwise. The coefficient estimate associated with the dummy variable measures the impact of the event on the portfolio. The model we estimate is:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^2 \beta m_{ij} Rm_{i,t+j-2} + \sum_{j=1}^2 \beta m_{ij}' DRm_{i,t+j-2} + \sum_{j=1}^2 \beta w_{ij} Rw_{i,t+j-2} + \sum_{j=1}^2 \beta w_{ij}' DRw_{i,t+j-2} \quad (1)$$

$$+ \delta l_i Rrl_{i,t} + \delta s_i Rrs_{i,t} + \kappa_i Rf_{i,t} + \gamma_i DG + e_{it}$$

where, R_{it} is the return on portfolio i ($i=11$, each country has one equally weighted portfolio) at day t , $Rm_{i,t}$ is the return on market index of country i at day t , Rw_t is the return on MSCI world equity index at day t , DG is a dummy variable that is equal to 1 over every event window⁶ and zero otherwise, γ_i is the coefficient of a dummy variable that captures the impact of GLBA on the banking industry of i th country. $Rf_{i,t}$ represents the return on exchange rate between U.S. dollar and the currency of i th country at day t ; $Rrs_{i,t}$ represents the return on short term interest rate for country i at day t ; $Rrl_{i,t}$ represents the return on long term interest rate for country i at day t . D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise, thus $\beta m'_{i1} - \beta m'_{i2}$

⁶ Event windows are defined in Table 5.

captures the change in exposure to systematic risks between pre-act and post-act time for country i with respect to its own country equity index and $\beta w'_{i1} - \beta w'_{i2}$ captures the change in exposure to systematic risks between pre-act and post-act time for country i with respect to its MSCI world equity index.

We estimate the model presented in equation 1 using seemingly unrelated regression methodology. Schwert (1981) argues that individual asset returns of the firms in the same industry measured over a common time-period are contemporaneously correlated because the firms will react similarly to any unanticipated event. So in events such as regulatory changes the residuals will not be *iid*. If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, SUR model estimates will be more efficient than Ordinary Least Squares (OLS). We use a likelihood ratio (LR) test suggested by Berndt and Savin (1977) to test the null hypothesis that the off-diagonal elements of the variance-covariance matrix are zero⁷. We perform this test to check for contemporaneous correlation among the disturbances across equations.

The main advantage of using the SUR is that it allows us to test for the interesting cross-country restriction (hypothesis 2). In order to test for hypothesis 2 we test the following null hypothesis:

⁷ This test in principal determines whether the off-diagonal elements of the *variance covariance matrix* (Σ) of error terms are zero or not. Excluding the diagonal elements, there are $1/2m*(m-1)$ unknown parameters in Σ that can be arranged in a vector, θ . Here m is the number of equations. The null hypothesis is:

$$H_0: \theta = 0$$

This test is based on the following statistic:

$$\lambda_{LR} = T \left[\sum_{i=1}^m \log \hat{\sigma}_i^2 - \log |\hat{\Sigma}| \right]$$

here $\hat{\sigma}_i^2$ is $e_i' e_i / T$ from the individual least squares regression and $\hat{\Sigma}$ is the maximum likelihood estimator of Σ . This statistic has a limiting χ^2 distribution with $1/2m*(m-1)$ degrees of freedom under the null hypothesis.

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \dots = \gamma_{11} \quad (2)$$

4.6.3 Cross Sectional Analysis

In order to test for our fourth hypothesis, we generate average abnormal return, i.e. γ_i ($i=1$ to 215) for each firm using the model presented by equation 1. We then estimate the following model using OLS, where γ_i is the dependent variable. The cross-sectional model is:

$$\gamma_{i,j} = f(\text{can}, \text{den}, \text{fra}, \text{ger}, \text{gre}, \text{ita}, \text{jap}, \text{spa}, \text{swi}, \text{uk}, \beta m'_{i,j}, \beta w'_i, \text{Size}_i, \text{ROE}_i) \quad (3)$$

where, *can, fra, ... uk* are country dummies, which are equal to one if a firm is from that country, and zero otherwise. These dummies will control for country specific variations. $\beta m'_{i,j}$ and $\beta w'_i$ are changes in exposure to systematic risk with respect to a home country market index and the MSCI world equity index. Size_i is defined as the log of total asset value (in U.S. dollars) in 1998 for firm i and ROE_i is the return on equity of firm i in 1998.

4.7 Empirical Results

4.7.1 Portfolio Analysis

The result of the specification test for our portfolio model shows that the null hypothesis that off diagonal elements of the variance-covariance matrix is zero is rejected at the 1% level. Statistically that means that coefficient estimates from SUR are more efficient as opposed to the OLS estimates.

Estimates of the parameters of the portfolio model are presented in Table 5. We find that for most of the countries the own country equity index is significant and positive (except Spain) while we find that MSCI world equity index is positive and significant for the U.S. only.

Table 5: Estimation results of model parameters of the portfolio model (equation 1).

The following table presents the estimation results of portfolio model:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^2 \beta_{m_j} R_{m_{i,t+j-2}} + \sum_{j=1}^2 \beta_{m_j} ' DR_{m_{i,t+j-2}} + \sum_{j=1}^2 \beta_{w_j} R_{w_{i,t+j-2}} + \sum_{j=1}^2 \beta_{w_j} ' DR_{w_{i,t+j-2}} + \delta l_i Rrl_{i,t} + \delta s_i Rrs_{i,t} + \kappa_i Rf_{i,t} + \gamma_i DG + e_{it}$$

where, R_{it} is the return on portfolio i at day t , $R_{m_{i,t}}$ is the return on own market index of country i at day t , $R_{w_{i,t}}$ is the return on MSCI world equity index at day t , DG is a dummy variable that is equal to 1 over every event window and zero otherwise, $Rf_{i,t}$ represents the return on exchange rate between U.S. dollar and the currency of i th country at day t , $Rrs_{i,t}$ represents the return on short term interest rate for country i at day t , $Rrl_{i,t}$ represents the return on long term interest rate for country i at day t . D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise.

Country	Intercept	Change in the intercept	Own Country Equity index (1 day lag)	Own Country Equity index	Change in the Own Country Equity index (1 day lag)	Change in the Own Country Equity index	MSCI World Equity index (1 day lag)	MSCI World Equity index
Canada	-126.63	526.89 ***	0.06	1.17 **	0.27	-0.79	1089.67	578.39
	-1.48	4.36	0.12	2.33	0.47	-1.39	1.03	0.45
Denmark	75.04 ***	77.20 ***	0.05 *	0.07 ***	0.00	-0.04	37.48	14.60
	5.72	3.99	1.73	2.76	0.00	-0.97	0.24	0.09
France	63.73 ***	28.00 **	0.02 *	0.02 *	0.00	0.00	-51.97	34.27
	13.39	2.47	1.71	1.83	-0.23	-0.18	-0.51	0.30
Germany	31.50	556.67 ***	-0.03	0.56 ***	0.00	-0.36 **	-215.32	-107.26
	1.45	14.79	-0.28	4.73	0.03	-2.24	-1.02	-0.42
Greece	-1140.05 ***	37.75	-0.19	3.30 ***	0.44	-0.65	-231.61	1179.73
	-31.94	0.35	-0.53	9.11	0.85	-1.25	-0.15	0.78
Italy	-222.91 ***	773.24 ***	0.05	0.30 ***	0.01	-0.16 ***	3.20	147.61
	-7.94	14.37	1.12	6.80	0.14	-2.63	0.01	0.32
Japan	116.00 ***	-29.43 ***	-0.08 **	0.10 ***	0.04	-0.02	49.85 *	4.68
	75.93	-8.16	-2.34	3.13	0.87	-0.51	1.77	0.16
Spain	763.97 ***	197.86 **	0.88	-0.14	-1.16	0.52	-284.09	-686.42
	17.27	2.14	1.50	-0.24	-1.33	0.60	-0.62	-1.23
Switzerland	-196.94 ***	-186.28 ***	0.13 **	0.34 ***	-0.01	0.13	-343.61 ***	-112.07
	-18.27	-8.98	2.34	6.29	-0.13	1.38	-3.61	-0.95
UK	-16605.60 ***	12502.30 ***	0.18	1.38 ***	-0.01	-0.70 **	-2275.14	2018.44
	-32.02	7.29	0.76	5.92	-0.02	-2.03	-0.33	0.27
USA	-7.47	10.64	-3453.68 **	3342.52 **	2066.36	-6297.22 ***	-418.13	12833.00 ***
	-0.98	0.87	-2.31	2.26	1.05	-3.19	-0.33	9.95

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Table 5: Estimation results of model parameters of the portfolio model (equation 1)
continued.

Country	Change in the MSCI World Equity index (1 day lag)	Change in the MSCI World Equity index	Exchange rate with U.S.	Long-term Interest rate	Short- term Interest rate	Average return on 13 events	R ²
Canada	-2514.29 -1.47	-1115.53 -0.56	541.26 0.44	169.85 0.38	-260.16 -0.49	-148.87 *** -4.01	0.39
Denmark	-105.15 -0.42	-28.66 -0.12	-2.29 * -1.92	-50.39 -0.92	20.89 0.32	-17.50 *** -3.38	0.75
France	-226.11 -1.36	-159.42 -0.89	-9.43 -0.13	-11.52 -0.43	-23.00 -0.67	-1.27 -0.35	0.87
Germany	-49.47 -0.15	-93.42 -0.23	-331.88 -1.56	-96.11 -0.72	281.69 * 1.80	-18.39 ** -2.52	0.81
Greece	-61.13 -0.02	-123.73 -0.05	677.00 0.51	359.41 0.47	266.65 0.55	-119.48 ** -2.27	0.96
Italy	-631.51 -0.95	-639.23 -0.88	179.91 0.47	94.57 0.55	-77.50 -0.41	7.00 0.49	0.89
Japan	-52.68 -1.13	26.54 0.59	28.73 1.64	-0.41 -0.08	-0.10 -0.66	-2.77 *** -2.85	0.59
Spain	359.52 0.48	673.63 0.78	-219.80 -0.50	-78.55 -0.25	-191.26 -0.95	-74.05 *** -4.61	0.44
Switzerland	138.42 0.90	-61.17 -0.35	-117.08 -1.41	47.52 1.08	-9.61 -1.01	6.19 * 1.86	0.94
UK	-9792.25 -0.87	-13370.90 -1.10	5.05 0.00	1274.47 0.53	422.93 0.13	-97.75 -0.40	0.67
USA	-3415.17 * -1.71	2370.45 1.17	7555.73 *** 4.85	-502.58 -0.64	-1276.00 -1.34	74.14 *** 2.62	0.42

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

We find that 7 out of 10 countries we analyze have significant average abnormal returns from the 13 events that we analyze. Banking industries of six countries have negative spill over effect from the passage of the GLBA, these are Canadian banking industry (it has an average abnormal return of -148.87 which is also significant at 1%), Denmark's banking industry (it has an average abnormal return of -17.50 significant at 1%), Germany's banking industry (it has an average abnormal return of -18.39 which is significant at 5%), Greece's banking industry (it has an average abnormal return of -119.48 which is also significant at 1%), Japanese banking industry (it has an abnormal

return of -2.77 which is significant at 1%), and Spain's banking industry (it has a significant abnormal return of -74.05 significant at 1%). The banking industry of Switzerland has an average abnormal return of 6.19 significant at 10%. The banking industries of France, Italy and the UK seem to be unaffected by the passage of GLBA. These results support our first hypothesis that there are significant spillover effects of the GLBA on banking industries of developed countries and the third hypothesis that these spillover effects are negative.

Our second hypothesis that the information produced over these 13 events has the same impact on the banking industry of any two countries is rejected at the 1% level. This hypothesis is tested using a Wald test (presented by equation 2) with a test statistic of 76.78. The underlying distribution under the null hypothesis is $\chi^2_{(10)}$.

4.7.2 Cross Section Analysis

In order to identify the cross sectional variation in average return from the events that led to the GLBA we perform a cross sectional analysis. We estimate equation 3 using OLS. The result of the estimation is presented in Table 5; the t-statistics are computed using the formula suggested by MacKinnon and White (1985). We use country dummy variables to control for the country specific effects. The variables that are significant may be due to the country specific variables (like trade with the United States, exchange rate, size of the source countries financial sector as suggested by the literature on the determinants of foreign bank presence, activity and growth in the USA) or due to country specific events in those periods, or the exposure to the U.S. market.

The main hypothesis we want to test is whether GLBA created or reduced the diversification opportunity for international banks. We find that $\beta w'_{ij}$ is positive and

significant. This means diversification opportunities for these banks, with respect to world index has been reduced. This complies with our major hypothesis that the GLBA reduced diversification opportunities for foreign banking companies.

Table 6: Cross-sectional analysis of wealth effect on each firm in the banking industries of selected developed countries.

We estimate the following model:

$$\gamma_{i,j} = f(\text{can}, \text{den}, \text{fra}, \text{ger}, \text{gre}, \text{ita}, \text{jap}, \text{spa}, \text{swi}, \text{uk}, \beta m'_{i,j}, \beta w'_{i,j}, \text{Size}_i, \text{ROE}_i)$$

We estimate the model using OLS using 215 firms in the sample. Here $\gamma_{i,j}$ is the abnormal return of firm i of country j , $\text{can}, \text{den}, \dots, \text{uk}$ are dummy variables for a particular country, these variables are equal to one for that country and zero otherwise. $\beta m'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. While $\beta w'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. Size is log of book value of total asset and ROE is return on equity

Parameter	Estimate	t-statistic	P-value
CAN	29.02	1.03 [.305]	
DEN	20.77	1.97 [.051]	
FRA	27.50	2.67 [.008]	
GER	-1.07	-0.06 [.955]	
GRE	-58.51	-2.43 [.016]	
ITA	21.73	1.69 [.093]	
JAP	51.82	2.46 [.015]	
SPA	-3.38	-0.17 [.867]	
SWI	25.10	2.56 [.011]	
UK	54.06	3.00 [.003]	
$\beta m'_{i,j}$	-9.94	-0.79 [.428]	
$\beta w'_{i,j}$	0.06	3.27 [.001]	
SIZE	-3.41	-1.76 [.080]	
ROE	0.01	0.27 [.791]	
R²	0.54		
F-Statistics	15.36 ***		

We use *Size* and profitability measures in the cross sectional regression because Hendershott, Lee, and Tompkins (2002) find that both of these variables can explain the cross sectional variation in wealth effects for domestic commercial banks from the passage of the GLBA. For international firms we find evidence that larger firms have more negative wealth effects. Since larger firms generally would be interested in

international diversification and have more U.S. exposure, a reduction of such opportunities should affect them more.

4.8 Conclusion

We examine the impact of the GLBA, a major regulatory change in U.S. financial services industry, on a sample of 215 non-U.S. banks companies from 10 countries. In the era of globalization of financial markets it is argued in the literature that deregulation like the GLBA, or single market program of EU should have an impact beyond the boundaries of the jurisdiction⁸. In this paper we present further evidence of globalization of financial institutions. In our portfolio analysis we find that banking industries of 7 out of 10 developed countries have significant wealth effects from the passage of the GLBA (of which only Switzerland has a positive, but insignificant impact), a deregulation that is designed to deregulate the financial services industry of the United States. We also find that the impact of the GLBA is not the same for any two banking industries of foreign countries.

The cross sectional investigation suggests that a part of negative reaction is due to country specific attributes in that period. But most importantly, we show that the negative wealth effect is due to the reduction in the diversification opportunities for international banks that is due to the passage of the GLBA. This reduction in diversification opportunity from the GLBA can be due to increased competition from domestic participants, restrictions imposed on the scope of activities permissible to foreign banks, restructuring the way certain business were carried out, or due to FED's capitalization and management standards for its U.S. operation as well as its worldwide operation.

⁸ Berger, DeYoung and Udell (2000).

Anecdotal evidence also supports the argument that the GLBA adversely affected the presence of foreign banks in the U.S. For example, Blanden (2000) reports that the number of foreign banks in the U.S. has been declining. In addition, Table 2 shows that only 7% of the foreign banks present in the U.S. have adopted the FHC structure, a structure through which most of the new opportunities are available to foreign banks. Finally, we argue that the GLBA will restrict the expansion and entry of international banks in the U.S.

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Chapter V

Implications of the GLBA on Foreign Insurance Companies

5.1 Abstract

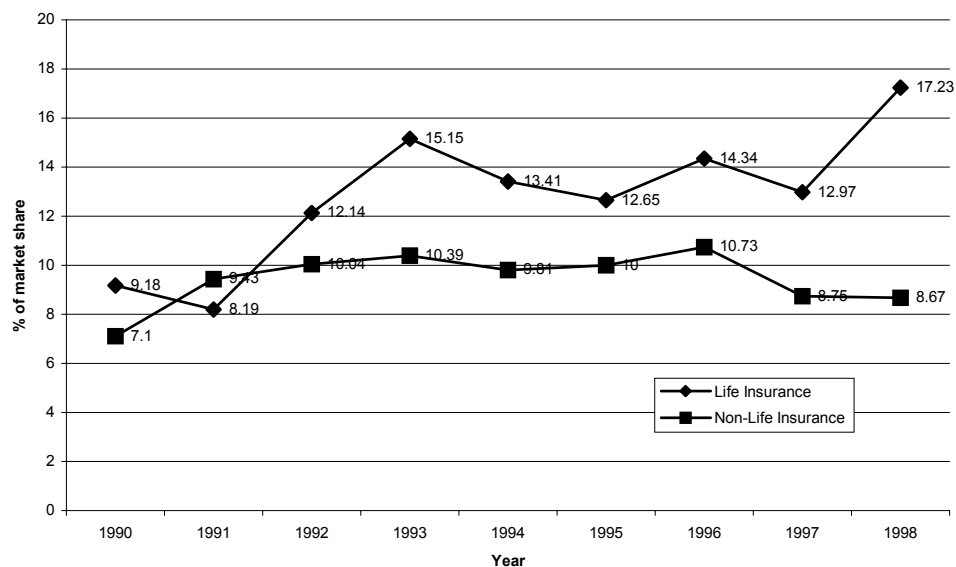
The purpose of this paper is to investigate the impact of the Gramm-Leach-Bliley Act (GLBA) on the insurance industries of developed countries. We find that the insurance industries of most of the developed countries in our sample have significant negative spillover effects from the GLBA. Further, we find that this regulation has had a different impact on the insurance industries of any two countries in our sample. We find evidence that suggests that a reduction in the diversification opportunities due to the passage of the GLBA can explain the wealth effect of the individual firms in cross section analysis. However, we don't find any evidence that the impact of the GLBA is statistically different for firms that are from a EU member country versus those that are not.

5.2 Introduction

The Gramm-Leach-Bliley Act (GLBA) of 1999 is the most sweeping deregulation of the U.S. financial services industry in the last century. Current research finds that the GLBA has positively affected shareholder value in the U.S. insurance industry. In an era

of globalization of financial markets and institutions, one would expect the impact of such extensive deregulation as the GLBA would not be contained by the boundaries of a nation. This paper focuses on the insurance industries of developed countries to investigate the international impact of the GLBA.

Figure 1: Market Share of foreign controlled companies and branches and agencies of foreign companies in the U.S. insurance market (Gross Premium Basis)



Source: OECD Insurance Statistics Yearbook

This study focuses on three important questions; first, does the Gramm-Leach-Bliley Act (GLBA) create opportunities or hinder the growth of foreign insurance firms in the U.S. Current research finds that the GLBA does not have a uniform effect on the financial services industry. However, these studies consistently find that the GLBA has positively affected shareholder value in the insurance industry. So it is interesting to consider whether this act likewise creates opportunity for non-U.S. insurers. Foreign insurers share of the U.S. is rapidly growing. In 1990, only 9.8% of the market share

(gross premium) in life insurance and 7.1% the market share (gross premium) in non-life insurance in the United States was written by foreign controlled companies,¹ or branches and agencies of a foreign insurers. However, by 1998 the market share controlled by foreign insurers increased to 17.23% of life insurance and 8.67% of non-life insurance. Figure 1 shows the trend in foreign insurers market share in the U.S. market since 1990. Historically, increases in the activity of foreign financial firms in the U.S. have created political pressure on regulators to restrict their growth. For example, Goldberg and Saunders (1981) note that rapid growth in foreign banks in the U.S. in the early 70s led to restrictions in multi-state operations of all foreign banks, and subsequently led to the International Banking Act of 1978.

Secondly, we investigate if the impact on foreign insurance firms varies across countries and firm-specific attributes. Vaughan and Vaughan (1999), and Moshirian (1997) predict that U.S. insurance companies will face competition for European insurers in the domestic market. Table 1, presents a list of the top 25 insurers in 1998 on the basis of the revenue earned in 1998. Interestingly, of the top 25 firms, 11 companies are from EU countries and 6 are from Japan, while the U.S. controls more market share than the combined market share of all EU member countries². We investigate whether the impact on EU insurers are different from non-EU insurers. We also explore whether firm specific variables that can explain the abnormal returns of the domestic insurers from the GLBA can also explain the returns of the foreign insurance companies.

¹ Companies in the United States whose equity is at least 10% owned by non-U.S. persons (before 1990). Thereafter, foreign (non-U.S.) persons that own equity directly, or indirectly through a holding company system, 10% or more of the company.

² 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the UK.

Finally, we investigate if the GLBA creates diversification opportunities for foreign insurers and thereby reduces exposure to systematic risk. Because Cummins and Weiss (2000) suggest that international diversification may improve the risk-expected return tradeoff and profit efficiency for the insurance industry.

Table 1: World's Largest Insurance Companies by Revenues, 1998

Rank	Name	Country of Domicile	1998 Revenues (\$ millions)
1.	AXA	France	78,729
2.	Nippon Life	Japan	66,300
3.	Allianz	Germany	64,875
4.	ING Group	Netherlands	56,469
5.	Assicurazioni Generali	Italy	48,478
6.	State Farm	USA	44,621
7.	Dai-ichi Mutual Life	Japan	44,486
8.	Sumitomo Life	Japan	39,535
9.	Zurich Financial	Switzerland	39,115
10.	CGNU	UK	37,589
11.	TIAA-CREF	USA	35,889
12.	Munich Re Group	Germany	35,465
13.	Prudential of America	USA	34,427
14.	Prudential (UK)	UK	33,677
15.	American Int'l Group	USA	33,296
16.	Meiji Mutual Group	Japan	28,476
17.	Metropolitan Life	USA	26,735
18.	Allstate	USA	25,879
19.	Royal and Sun Alliance	UK	25,436
20.	CNP Assurances	France	24,108
21.	Mitsui Mutual Life	Japan	22,226
22.	Loews	USA	20,713
23.	New York Life	USA	19,849
24.	Asahi Mutual Life	Japan	19,418
25.	Aegon	Netherlands	18,727

Source: Jeremy Kahn, "The Fortune Global 500," *Fortune*, August 2, 1999.

In this study we analyze 83 foreign insurance companies from 11 countries, our sample includes 8 EU member countries (Austria, France, Germany, Greece, Ireland, Italy, Spain and the UK) and 3 are non-EU countries (Canada, Japan and Switzerland). We also have included 31 U.S. insurance firms in this study for the purpose of comparison. We find that most of the foreign insurance industries are significantly and

negatively affected by the events leading to the passage of the GLBA. Those negatively affected are Canada, France, Germany, Greece, Ireland, Japan, and the UK. The insurance industries of Switzerland is largely unaffected by the regulation. However, Spain and Austria has positive impact from the passage of the regulation. We don't find any evidence that the impact of the GLBA is statistically different for firms that are from a EU member country versus those that are not.

Most importantly, we find that the GLBA has reduced the capability of foreign insurers to diversify their portfolio risk by restricting their entry and expansion in the U.S. market.

The rest of the study is organized as follows: the second section provides a literature review. Section three briefly discusses the GLBA. Section four introduces the major hypotheses. Section five describes the methodology, data and lists the major events. Section six presents the empirical results and a final section concludes.

5.3 Literature:

5.3.1 Literature on the impact of GLBA on domestic Financial Institutions

Current research finds that the GLBA has not had a uniform affect on the financial services industry. Studies consistently find that the GLBA positively affects shareholder value in the insurance industry; however, depending on the sample size and number of events investigated the results for other financial services are mixed. Carow and Heron (2002) find that only the insurance industry gains from this law. Akhigbe and Whyte (2001) find that all the sectors of the financial services industry benefit from this law, while Hendershott, Lee, and Tompkins (2002) conclude that this law doesn't impact the banking industry.

5.3.2 *Literature on international spillover effects*

There is evidence in the literature that the impact of GLBA will not be limited to the U.S. financial services industry. Bruner and Simms (1987) examine the reaction of U.S. banks to Mexico's loan crisis and find that U.S. banks reacted negatively to the news. Musumerci and Sinkey (1990) find that Brazil's announcement of a debt moratorium in 1987 had a negative impact on U.S. money center banks. Madura, Whyte and McDaniel (1991) find that Citicorp's announcement of substantial increase in loan-loss reserves in 1987 had a significantly negative impact on British banks. In all of the above cases the exposure of banks to less developed countries are identified as the reason for the negative reactions. Cummins and Weiss (2000) find that international diversification can improve both the risk-expected return tradeoff and profit efficiency for the insurance industry.

Carow and Heron (2002) document the only direct evidence of any spillover effects from the GLBA. This study primarily focuses on the implications of GLBA on domestic financial institutions, but includes a sub-sample of 10 foreign banks that are publicly traded in the U.S.. These banks experienced a negative wealth effect from the passage of the GLBA. Carow and Heron argue that the less favorable reaction of foreign banks (compared to that of U.S. banks) is due to the requirement imposed by the GLBA that the entire foreign banking organization has to be well capitalized. Although the sample size in this study is very small, it provides us with evidence of spillover effects of the GLBA on foreign banks. In addition, Berger et al. (2000) predict that cross-border mergers and acquisitions may be motivated by the GLBA.

5.3.3 *Literature on FDI in Insurance & Banking Industry*

There are several studies that investigate foreign direct investment (FDI) in the U.S. insurance industry. Moshirian (1997) finds that demand for insurance services in the U.S., along with the relative rate of return, labor cost, exchange rate, size of the source countries' insurance sector, bilateral relations and trade between the U.S. and the host countries are the major determinants of FDI in the insurance industry in the U.S. Grosse and Goldberg (1991) investigate foreign banking activity in the United States by country of origin. Their results show that foreign investment (FDI and foreign portfolio investment) in the United States, bilateral trade, and the size of each countries' banking sector (demand deposits and time deposits) are positively correlated with each countries bank presence in the U.S. Seth et al. (1998) show that one of the major determinants of financial institutions' growth abroad has been the parallel growth of foreign direct investment and foreign trade by globally oriented multinational corporations from the institution's home country.

5.4 *GLBA and the Insurance Industry*

Under the new law (GLBA), insurance remains a state-regulated business (the McCarran-Ferguson Act remains in place). The GLBA repeals sections of the Banking Act of 1933, including sections 20 and 32, which prohibits national banks from maintaining securities firms and bank officials from sitting on corporate boards of insurance companies. It also amends the Bank Holding Company Act of 1956 and creates a new entity known as a Financial Holding Company (FHC). The FHC is the centerpiece of this financial modernization. FHCs may engage in activities that are financial in nature including banking, securities, insurance (underwriting as well as sales as an agent), and

merchant banking. To qualify as an FHC each subsidiary has to be well managed and well capitalized. In addition, the depository subsidiary of the FHCs has to comply with the Community Reinvestment Act (CRA) rating requirement.

The GLBA also creates a new type of subsidiary, known as a ‘financial subsidiary’, through which banks can conduct many of the same activities as that of a subsidiary of an FHC³. A significant exception is that insurance underwriting may not be conducted in a financial subsidiary. However, to own such a financial subsidiary, the GLBA requires that the bank and each of its depository subsidiaries be well managed and well capitalized.

The GLBA also repeals Title VI of the Garn-St. Germain Act, which states that the sale or underwriting of insurance is “not closely related” to banking, which had effectively preventing bank holding companies from selling and underwriting insurance. The GLBA also preempts anti-affiliation laws. Any attempt by a state to deny a depository institution from trying to affiliate an insurer can be nullified since states are forbidden from discriminating against such entities. Hence, the GLBA allows cross industry mergers that were not previously allowed under the OCC rulings.

In order to engage in any activity in the U.S., any financial intermediary must be well capitalized and well managed by the standards set by the Federal Reserve (FED). The FED will review worldwide operations of the financial intermediary to determine whether or not they can engage in business in the U.S.

5.5 Hypothesis

We test the following four major hypotheses.

³ Broome and Markham, 2001.

Hypothesis 1: *The GLBA will have a significant spillover effect on the insurance industry of developed countries.*

We expect that insurance industries of developed countries are going to have significant wealth effects due to the passage of the GLBA for two reasons. First, Bruner and Simms (1987), Musumerci and Sinkey (1990) and Madura, Whyte and McDaniel (1991) predict that if the financial sector of a country has exposure to any foreign market then an event in that foreign market can have spillover effects on the financial sector of that country. In 1998, foreign controlled companies, or branches or agencies of foreign companies, controlled 17.23% of the U.S. life insurance market and 8.67% of non-life insurance market in the U.S., and the lion share of these foreign companies are from developed countries.

Second, the insurance industry depends upon diversification of risk for its survival⁴. Traditionally, the United States has been the largest insurance market in the world. In 1990, the market share of the U.S. insurance industry was 44.39% and in 1998 it was 45.14% (on gross premium basis) of all OECD countries combined⁵. The size domination of the U.S. market exists both in life and non-life insurance. For example, in 1998 the U.S. insurance industry had 34.20% of the market share in life insurance and 57.23% of the market share in non-life insurance of OECD countries⁶. The size of the market share makes the U.S. insurance market a natural target for the foreign insurers to diversify their portfolio risk and also to expand their business in the U.S. insurance

⁴ Pfeffer (1976) argues that no country has sufficient private insurance capacity to absorb all the insurable risk in its territory.

⁵ OECD publications.

⁶ OECD publications.

market. Due to the size of the U.S. market, any major regulatory change like the GLBA should have an impacts on other insurance industries of other countries.

Hypothesis 2: *The impact of the GLBA on the insurance industries of any two countries will not be the same.*

Studies find that country specific characteristics such as exchange rate, size of the source countries insurance sector, and trade with the source country may explain FDI in the U.S. Thus we argue that since such characteristics, or the exposure to U.S. insurance market, are not same for any two countries, the impact of the GLBA on any two countries' insurance industries will not be the same.

Hypothesis 3: *The insurance industries of foreign countries will have a negative impact from the passage from the GLBA.*

The GLBA increased competition in the U.S. insurance industry. Under this regulation, an FHC is allowed to underwrite insurance and also work as agents. So newly created FHC will increase competition. One possible way holding companies may enter the insurance business is through acquisitions. Hendershott, Lee, and Tompkins (2002) and Mamun et al. (2003) predict that banks will acquire insurance firms and enter the insurance business. In addition, competition in the U.S. insurance industry may increase because banks can now enter the insurance business (working as agents) using a newly created financial subsidiary. These new domestic participants in the insurance business will have a “home field advantage”⁷ over foreign firms; and thus, we expect that foreign insurance companies may have negative wealth effects from the passage of GLBA.

Furthermore, capital adequacy and management requirements by the FED under the GLBA can also be a potential reason for negative wealth effects for foreign insurance

⁷ See Berger et al. (2000) for details discussion of the Home Field Advantage hypothesis.

firms. Carow and Heron (2002) argue that many countries impose lower capital requirements than the U.S. These eligibility requirements impose new costs for foreign banks that want to do business in the United States, whether as a FHC or under any other structure.

Hypothesis 4: *The GLBA will reduce the diversification opportunities of foreign insurance firms, and thereby increase risk for their stockholders.*

The GLBA will restrict the entry and expansion of foreign insurers in the U.S. insurance industry due to increased competition from domestic participants in the U.S. insurance industry who have “home field advantage” and also to tough capital adequacy and management requirements. This will reduce the diversification opportunities for foreign insurers in the largest insurance market in the world. This reduction in diversification benefits will increase risk for stockholders of foreign insurance firms in developed countries.

5.6 Data & Methodology

5.6.1 Data and Events

We test the above hypotheses using daily common stock returns over a period from January 1998 to December 2000. Daily stock return and balance sheet information for major insurance companies from Austria, Canada, France, Germany, Greece, Ireland, Italy, Japan, Spain, Switzerland, and the UK are obtained from the Datastream database. The daily stock returns for 31 major U.S. insurance firms are obtained from the CRSP database. The distribution of these firms across countries, along with some firm specific information and information regarding bilateral trade with the U.S., is presented in Table 2.

Table 2: Descriptive statistics of foreign insurance firms.

Country	No. of firms	Total Asset in 1999* [Ⓐ]	ROE in 1999 [Ⓐ]	Export from U.S. 99* [Ⓐ]	Import to U.S. 99* [Ⓐ]
Austria	4	\$7,361.03	5.85	\$2,588.20	\$2,909.30
Canada	8	\$13,581.62	5.53	\$166,600.00	\$198,711.10
France	5	\$121,844.71	19.00	\$18,877.40	\$25,708.60
Germany	10	\$83,787.01	14.88	\$26,800.20	\$55,228.40
Greece	2	\$788.53	12.85	\$995.50	\$563.10
Ireland	2	\$21,395.57	7.82	\$10,090.60	\$22,356.50
Italy	7	\$35,842.49	16.84	\$19,436.60	\$8,475.00
Netherlands	2	\$356,892.93	13.18	\$57,465.70	\$130,863.90
Spain	3	\$3,998.56	19.14	\$6,133.40	\$5,059.20
Switzerland	7	\$48,517.03	9.82	\$8,371.30	\$9,538.60
UK	23	\$60,554.09	20.33	\$38,407.10	\$39,237.20
USA	31	\$91,216.92			

*In millions of U.S. dollars

[Ⓐ]Source: Data stream

[Ⓐ]Source Board of Governors Federal Reserve System.

We identify 13 major events from the Wall Street Journal and Lexis-Nexis wire service. In Table 3, we summarize the important events.

5.6.2 *Portfolio Analysis:*

We first adapt the model used by Blinder (1985), and then following Wagster (1996), we introduce long-term and short-term interest rates to control for interest rate risk. We also include returns on the exchange rate with the U.S. dollar because returns on foreign investment will depend on returns on the assets within each market and changes in the exchange rate. We then modify the model following Cornett and Tehranian (1990) and introduce the lagged value of the market index for possible nonsynchronous trading effects. We use dummy variables to identify the major events that led to the passage of the GLBA. The dummy variable is equal to 1 over every event window and zero otherwise. The coefficient estimate associated with the dummy variable measures the impact of the event on the portfolio. The model we estimate is:

Table 3: Time line of the Gramm-Leach-Bliley Act.

Note: The first column 'Date' is the event date. If the event occurred after the trading closed for a day then that the next trading day is the event date. Event Window is defined as Event Date, -1 day and +1 day. The second column 'Event' describes the main event.

Date	Event
11/4/98	1. (i) Senator Alfonse D'Amato loses his re-election bid (11/03/98 –night). (ii) Senator Gramm to take over as a chair of Senate Banking Committee. (11/04/98).
1/8/99	2. Financial Services Reform Bill is reintroduced in Congress.
2/17/99	3. Draft bill is unveiled in the Senate.
4/12/99	4. Senator Gramm meets with Senate Minority leader to work on the bill.
4/28/99	5. Senate Banking Committee formally files the Financial Services Modernization Act in the Senate.
5/4/99	6. Clinton raises the privacy issue to be included in the bill.
05/06/99 – Midnight	7. Senate passes S. 900. Senate version of the Bill is passed.
7/1/99	8. House version of the bill passes.
10/15/99	9. Federal Reserve and Treasury announce agreement on the regulation.
10/22/99	10. Gramm makes deal with White House on CRA.
11/02/99	11. Joint House Conference report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.
11/4/99	12. Senate passes the bill (90-8) and House passes the bill (362-57).
11/12/99	13. President Clinton signs the bill into law.

$$\begin{aligned}
R_{it} = & \alpha_i + \alpha_i' D + \sum_{j=1}^2 \beta m_{ij} Rm_{i,t+j-2} + \sum_{j=1}^2 \beta m_{ij}' DRm_{i,t+j-2} + \sum_{j=1}^2 \beta w_{ij} R w_{t+j-2} + \sum_{j=1}^2 \beta w_{ij}' DR w_{t+j-2} \\
& + \delta l_i R r l_{i,t} + \delta s_i R r s_{i,t} + \kappa_i R f_{i,t} + \sum_{k=1}^K \gamma_{ik} D_{kt} + e_{it}
\end{aligned} \quad (1)$$

where, R_{it} is the return on portfolio i ($i=12$, each country has one equally weighted portfolio) at day t , $Rm_{i,t}$ is the return on market index of country i at day t , Rw_t is the return on MSCI world equity index at day t , D_{kt} is the dummy variable which is equal to one on event window k and zero otherwise, so γ_{ik} captures the average impact of k th announcement on i th country. $Rf_{i,t}$ represents the return on the exchange rate between

the U.S. dollar and the currency of the i th country at day t ; $Rrs_{i,t}$ represents the return on the short term interest rate for country i at day t ; $Rrl_{i,t}$ represents the return on the long term interest rate for country i at day t . D is a dummy variable that is equal to 1 after the enactment of the regulation and zero otherwise. Thus $\beta m'_{i1} - \beta m'_{i2}$ captures the change in exposure to systematic risk between pre-act and post-act for country i with respect to its own country equity index, and $\beta w'_{i1} - \beta w'_{i2}$ captures the change in exposure to systematic risk between pre-act and post-act for country i with respect to its MSCI world equity index.

We estimate the model presented in equation 1 using seemingly unrelated regression. Schwert (1981) argues that individual asset returns of the firms in the same industry measured over a common time-period are contemporaneously correlated since firms will react similarly to any unanticipated event. So in events such as regulatory changes the residuals will not be *iid*. If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, SUR model estimates will be more efficient than Ordinary Least Squares (OLS). We use a likelihood ratio (LR) test to test the null hypothesis that the off-diagonal elements of the variance-covariance matrix is zero. We perform this test to check for contemporaneous correlation among the disturbances across equations.

The main advantage of using SUR is that it allows us to test interesting cross-country restrictions. In order to test for hypothesis 2 we test the following null hypothesis (here $a\gamma_i$ is average abnormal return from 13 events):

$$H_0 : a\gamma_1 = a\gamma_2 = a\gamma_3 = \dots = a\gamma_{12} \quad (2)$$

5.6.3 Cross Sectional Analysis

In order to test for our fourth hypothesis, we generate average abnormal returns from all 13 events for each firm using the model presented in equation 1. We then estimate the following model using OLS, where γ_i is the dependent variable. The cross-sectional model is:

$$\begin{aligned} \gamma_{i,j} = & \theta_{aus}aus + \theta_{can}can + \theta_{fra}fra + \theta_{ger}ger + \theta_{gre}gre + \theta_{ire}ire + \theta_{ita}ita \\ & + \theta_{spa}spa + \theta_{swi}swi + \theta_{uk}uk + \theta_m\beta m'_{i,j} + \theta_w\beta w'_i + \theta_{size}Size_i + \theta_{ROE}ROE_i + \varepsilon_i \end{aligned} \quad (3)$$

where, *aus*, *can*, *fra*, *uk* are country dummies, equal to one if a firm is from that country and zero otherwise. As mentioned in hypothesis 2 these dummies shall control for country specific variations. $\beta m'_{i,j}$ and $\beta w'_i$ are changes in exposure to systematic risk with respect to a home country market index and MSCI world equity index. *Size_i* is defined as the log of total asset value (in U.S. dollar) in 1998 for firm *i* and *ROE_i* is the return on equity of firm *i* in 1998.

5.7 Empirical Results

5.7.1 Portfolio Analysis

The result of the specification test for our portfolio model shows that the null hypothesis that the off-diagonal elements of the variance-covariance matrix is zero is rejected at the 1% level. Statistically that means that estimating the model with SUR is asymptotically more efficient as opposed to OLS.

Estimates of model parameters of the portfolio model are presented in Table 4. We find that for most of the countries the own country equity index is significant and positive while we find that MSCI world equity index is positive and significant for the U.S. only.

Table 4: Estimation results of model parameters of the portfolio model (equation 1).

Parameters	Austria	Canada	France	Germany	Greece	Ireland	Italy	Japan	Spain	Switzerland	UK	USA
Intercept	0.000	0.000	0.001	0.000	0.003 ***	0.000	0.000	-0.001 **	-0.001	0.000	0.000	-0.005
Change in the intercept	-0.001	0.001	0.000	0.001	-0.003 **	0.000	0.001 *	0.001 *	0.002 *	0.000	0.001	0.014 *
Own Country Equity index (1 day lag)	0.136 ***	0.027	0.069	0.081 **	0.003	0.030	0.057 *	0.033	0.111 ***	0.031	0.047	-1.968 **
Own Country Equity index	0.575 ***	0.587 ***	0.579 ***	0.567 ***	0.712 ***	0.451 ***	0.927 ***	0.768 ***	0.763 ***	0.956 ***	0.394 ***	4.706 ***
Change in the Own Country Equity index (1 day lag)	-0.100	-0.062	-0.138 *	-0.053	0.018	-0.015	-0.169 ***	-0.145 **	-0.027	0.029	-0.074	0.016
Change in the Own Country Equity index	-0.179 *	-0.238 **	-0.219 ***	-0.227 ***	0.312 ***	-0.117 *	-0.449 ***	-0.542 ***	-0.588 ***	-0.386 ***	-0.066	-5.392 ***
MSCI World Equity index (1 day lag)	-0.052	0.016	0.144 **	0.083	-0.003	-0.040	0.063	-0.015	0.164 **	0.064	0.119 ***	0.595
MSCI World Equity index	0.054	0.061	0.092	-0.033	-0.117	0.052	0.119 **	-0.005	0.018	0.007	-0.051	7.572 ***
Change in the MSCI World Equity index (1 day lag)	0.044	0.151	0.101	-0.120	0.026	0.130	0.036	-0.126	-0.173	-0.120 *	-0.010	-2.569 **
Change in the MSCI World Equity index	-0.010	-0.120	-0.158	-0.005	0.198	-0.092	-0.099	0.071	0.053	0.020	-0.065	2.509 *
Exchange rate with U.S.	0.008	0.098	-0.118 *	0.018	0.018	0.050	-0.022	0.028	-0.049	-0.045	-0.056	2.365 **
Long-term Interest rate	-0.009	-0.003	0.009	0.029	0.033	0.010	0.012	-0.001	-0.016	0.014	0.019	-1.273 **
Short-term Interest rate	-0.006	-0.025	0.029	0.011	-0.040	-0.026	0.026	0.000	0.024	0.001	0.013	0.517

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Table 4: Estimation results of model parameters of the portfolio model (equation 1) continued.

Events	Austria	Canada	France	Germany	Greece	Ireland	Italy	Japan	Spain	Switzerland	UK	USA
Event1	-0.006	-0.012 *	0.005	-0.002	-0.002	-0.001	0.001	0.006	-0.010	0.003	-0.004	0.002
Event2	0.004	0.007	-0.018 ***	-0.002	-0.006	0.010	-0.011 **	0.000	0.014 **	-0.006	0.000	-0.062
Event3	0.030 ***	-0.003	-0.002	0.000	0.006	0.004	-0.019 ***	-0.007	0.004	-0.004	-0.001	0.110
Event4	-0.001	-0.011	-0.009	-0.004	-0.020 *	0.003	0.003	0.006	-0.003	0.002	0.000	0.018
Event5	-0.002	0.009	0.008	0.003	0.000	0.007	0.006	0.002	0.001	0.004	-0.001	0.084
Event6	-0.001	-0.005	0.004	0.001	-0.005	-0.001	0.000	0.001	-0.013	-0.001	0.001	0.089
Event7	0.002	-0.007	-0.002	-0.008	0.000	0.001	-0.002	0.015 **	-0.001	-0.002	0.001	0.029
Event8	-0.004	-0.006	0.008	-0.003	-0.001	0.004	0.003	-0.001	0.002	-0.002	-0.003	-0.042
Event9	-0.001	-0.002	-0.006	0.002	-0.036 ***	0.010	0.000	0.041 ***	-0.006	0.006	0.001	0.070
Event10	-0.002	-0.007	0.007	-0.008 *	0.013	-0.012 *	-0.004	-0.009	-0.004	-0.002	-0.007 *	0.179 ***
Event11	-0.003	-0.020 **	-0.004	0.004	-0.005	0.010	-0.002	0.003	-0.005	-0.004	-0.008 *	0.010
Event12	-0.004	-0.024 ***	-0.004	0.000	-0.005	-0.003	-0.001	-0.006	-0.006	0.003	0.002	0.139 **
Event13	0.000	0.005	-0.007	-0.003	-0.010	-0.003	-0.004	-0.024 ***	0.000	-0.001	-0.009 **	-0.031
R²	0.254	0.212	0.385	0.465	0.508	0.235	0.656	0.414	0.431	0.705	0.287	0.496

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

We find that for Canada events 1, 11 and 12 create significantly negative average abnormal return, for France event 2 create significantly negative average abnormal return, for Germany event 10 create significantly negative average abnormal return, for Greece events 4 and 9 create significantly negative average abnormal return, for Ireland event 10 create significantly negative average abnormal return, for Italy events 2 and 3 create significantly negative average abnormal return, for Japan event 13 create significantly negative average abnormal return, while events 7 and 9 create significantly positive average abnormal return, for the UK events 10, 11 and 13 create significantly negative average abnormal return. However for Austria and Spain one event each create significantly positive abnormal return. Switzerland seems to remain unaffected from the events leading to the passage of the GLBA.

Our second hypothesis, that the information produced over these 13 events has the same impact on the insurance industry of any two countries, is rejected at 1%. This hypothesis is tested using a Wald test (presented in equation 2).

5.7.2 Cross Section Analysis

In order to identify the sources of the variation in returns around the events that led to the GLBA, we perform a cross sectional analysis. We estimate equation 3 using the OLS. The results of the estimation are presented in Panel A of Table 5; the t-statistics are computed using the formulas suggested by MacKinnon and White (1985). We use country dummy variables to control for the country specific effects.

We find that $\beta m'_{ij}$ is not significant. This result is expected because there is no major regulatory change in these countries that should impact the diversification opportunity of these insurance firms. $\beta w'_{ij}$ on the other hand is positive and significant.

This means that the diversification opportunities of these firms with respect to a world index has been reduced. This complies with our major hypothesis that the GLBA reduced the diversification opportunities of foreign insurance companies in the largest insurance market in the world.

Coefficient estimates for *Size* and *ROE* are not significantly different from zero, as expected. However, we use them for the purpose of comparison with the literature because Hendershott, Lee, and Tompkins (2002) find that size is significant and positive, and Mamun et al. (2003) find both size and ROE to be significant explanatory variables in analyses of the impact of the GLBA on domestic insurance firms.

We use the bootstrap method to test for the precision of our estimators due to the small number of observations. One may argue that asymptotic theory may provide a poor guide to the significance of the estimator. We can express equation 3 as follows:

$$y_i = X_i\theta + \varepsilon_i$$

We then use the following procedure:

1. We sample with replacement from the original (y, X) sample in pairs.
2. Then we estimate $\hat{\theta}_j$ and pseudo t -statistics for the each $\hat{\theta}_j$, we also compute 95% confidence interval for $\hat{\theta}_j$ and pseudo t -statistics for the each $\hat{\theta}_j$.
3. Repeat steps 1 and 2 for 1000 times.
4. Then compare the estimates and statistical significance with the normal OLS regression.

The bootstrap results are presented in Table V panel B. Using the bootstrap t -statistics, none of the country dummy variables are significantly different from zero, and coefficient estimates for $\beta m'_{ij}$, *Size* and *ROE* are also not significantly different from

zero. Bootstrap results for $\beta w'_{i,j}$ show that that coefficient estimate is positive significant (Figure 2 provides that distribution of θ_w).

Table 5: Cross-sectional analysis of wealth effect on each firm in the insurance industries of selected developed countries.

We estimate the following model:

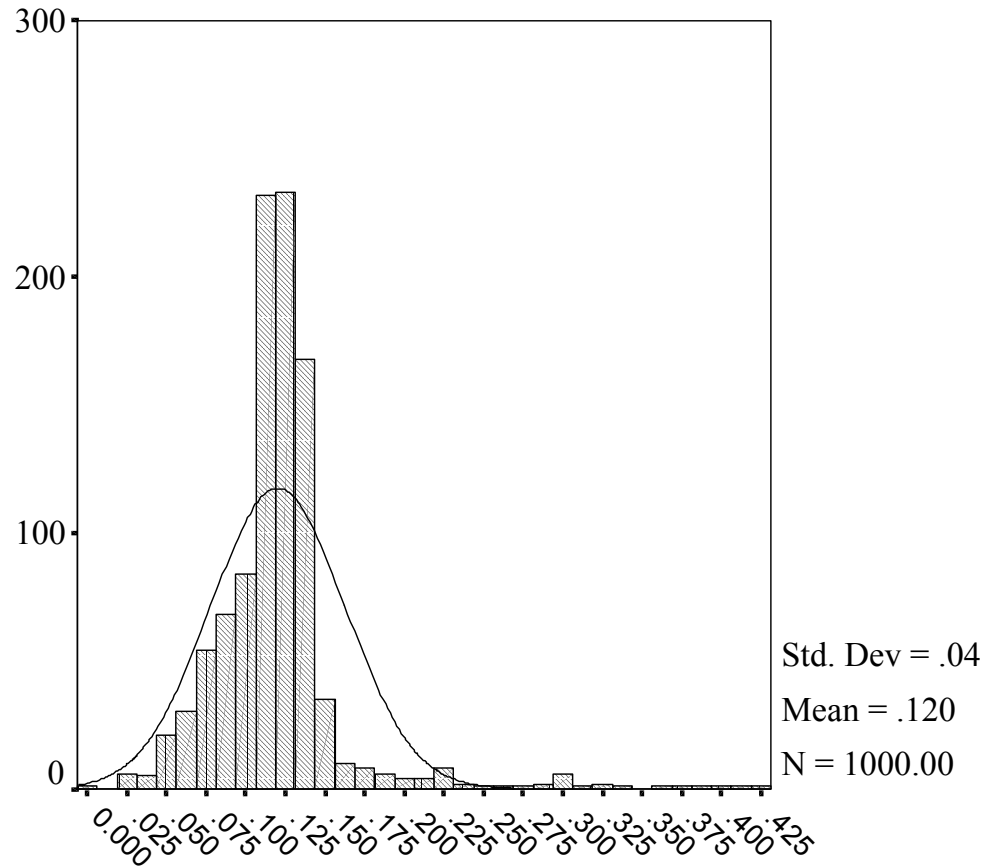
$$\gamma_{i,j} = \theta_{aus}aus + \theta_{can}can + \theta_{fra}fra + \theta_{ger}ger + \theta_{gre}gre + \theta_{ire}ire + \theta_{ita}ita + \theta_{spa}spa + \theta_{swi}swi + \theta_{uk}uk + \theta_m\beta m'_{i,j} + \theta_w\beta w'_i + \theta_{size}Size_i + \theta_{ROE}ROE_i + \varepsilon_i$$

We estimate the model using OLS for 71 firms in the sample. Here $\gamma_{i,j}$ is the abnormal return of firm i of country j . aus, can, \dots, uk are dummy variables for a particular country, these variables are equal to one for that country and zero otherwise. $\beta m'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. While $\beta w'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. $Size$ is log of book value of total assets and ROE is return on equity. Bootstrap p -values are based on 1000 replications.

Variables	Estimation Method: OLS		Estimation Method: Bootstrap					
	Coefficient Estimates	t-statistic	Coefficient Estimates			t-statistic		
			$E(\hat{\theta})$	2.5th percentile	97.5th percentile	$E(t-stat)$	2.5th percentile	97.5th percentile
θ_{aus}	-246.29	-0.25	-18.40	-1657.79	2708.13	-0.40	-4.63	3.75
θ_{can}	-588.80	-0.58	-349.71	-2010.80	2340.02	-1.19	-5.94	3.55
θ_{fra}	-60.25	-0.06	162.15	-1415.80	3163.75	-0.12	-4.24	3.99
θ_{ger}	-196.80	-0.19	7.97	-1722.58	2967.50	-0.40	-4.86	3.93
θ_{gre}	-273.12	-0.30	-119.17	-1538.25	2040.68	-0.48	-4.20	2.98
θ_{ire}	-69.57	-0.07	132.46	-1298.60	2809.47	-0.07	-3.49	3.45
θ_{ita}	-79.37	-0.08	116.53	-1467.11	2906.41	-0.24	-4.73	4.12
θ_{spa}	-148.19	-0.16	52.42	-1339.01	2605.55	-0.25	-4.15	3.64
θ_{swi}	-201.80	-0.19	36.45	-1599.84	3010.91	-0.41	-4.98	3.89
θ_{uk}	-255.18	-0.31	-14.87	-1139.64	2293.52	-0.54	-4.87	3.64
θ_m	-8.85	-0.16	-23.69	-161.99	85.76	-0.45	-3.61	2.75
θ_w	0.12 ***	5.61	0.12	0.05	0.23	10.43	3.27	24.69
θ_{size}	2.65	0.04	-11.15	-185.94	81.01	0.21	-4.39	5.27
θ_{ROE}	3.28	1.64	3.26	-0.65	8.82	0.97	-0.20	2.16
R^2	0.658							
F -Statistics	8.425 ***							

*** Significant at 1%

Figure 2: Distribution from bootstrap of θ_w
Empirical distribution of θ_w for 1000 bootstrap samples.



We also test whether EU firms have a different impact from the GLBA than non-EU firms. We modify equation 3, and then replace all the country dummy variables with one dummy, which is 1 if it is a EU country and zero otherwise. The modified model is presented in equation 4 as:

$$\gamma_{i,j} = \text{Intercept} + \theta_{eu} eu + \theta_m \beta m'_{i,j} + \theta_w \beta w'_i + \theta_{size} Size_i + \theta_{ROE} ROE_i + \varepsilon_i \quad (4)$$

Here we test the hypothesis, $H_0 : \theta_{eu} = 0$. The result, as presented in Table 6, shows that the null hypothesis is maintained; i.e. insurance companies from EU member countries are not affected differently from those in non-EU countries.

Table 6: Cross-sectional analysis of wealth effect on each firm in the insurance industries
EU vs. Non-EU countries.

We estimate the following model:

$$\gamma_{i,j} = \text{Intercept} + \theta_{eu} eu + \theta_m \beta m'_{i,j} + \theta_w \beta w'_i + \theta_{size} Size_i + \theta_{ROE} ROE_i + \varepsilon_i$$

We estimate the model using OLS for 83 firms in the sample. Here $\gamma_{i,j}$ is the abnormal return of firm i of country j . eu is a dummy variable which is 1 if it is a EU member country and zero otherwise. $\beta m'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. While $\beta w'_{i,j}$ is the change in exposure to systematic risk with respect to home country market index. $Size$ is log of book value of total asset and ROE is return on equity.

Parameter	Estimate	t-statistic
Intercept	228.656	0.271
θ_{eu}	229.861	1.014
θ_m	-17.292	-0.301
θ_w	0.121 ***	6.178
θ_{size}	-37.262	-0.690
θ_{ROE}	2.461	1.468
R ²	0.646	
F-Statistics	23.382 ***	

***, ** and * denote significance at 1%, 5% and 10% levels respectively.

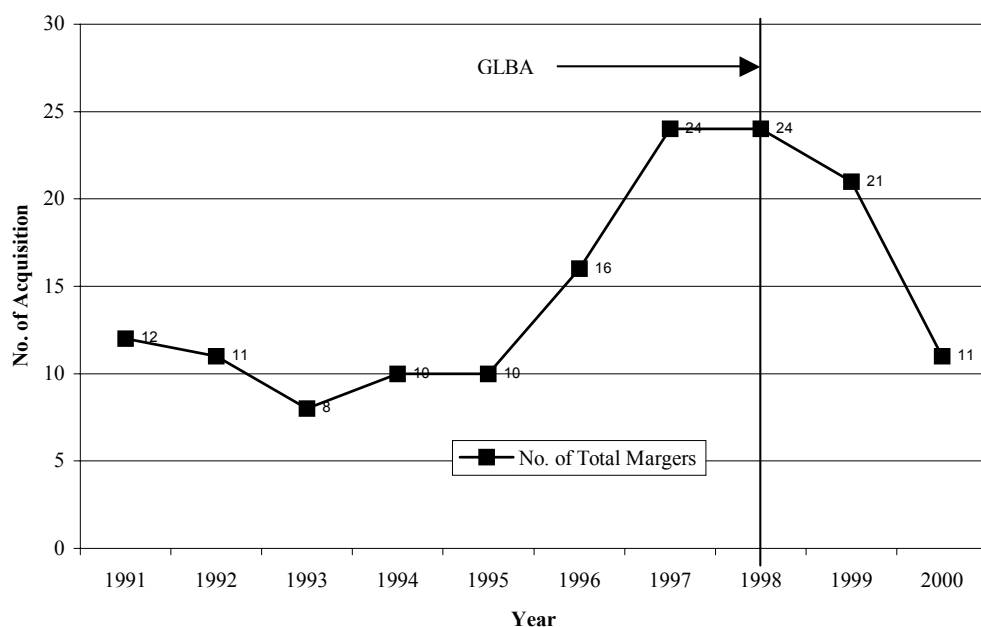
5.8 Conclusion

We examine the impact of the GLBA, a major regulatory change in the U.S. financial services industry, on a sample of 83 non-U.S. insurance companies from 11 countries. In an era of globalization of financial markets, it is argued in the literature that deregulations like the GLBA or the single market program of EU should have an impact beyond the boundaries of the jurisdiction⁸. In this paper we present further evidence of the globalization of financial institutions. In our portfolio analysis we find that insurance industries of 8 out of 11 developed countries have significant negative wealth effects from passage of the GLBA, a deregulation that was designed to impact the financial services industry of the United States. We also find that the impact of the GLBA is not

⁸ Berger, DeYoung and Udell (2000).

the same for any two foreign insurance industries. And the impact of the GLBA is statistically not different for firms from a EU member country or not.

Fig 3: Acquisition of the US insurance companies by foreign insurers.



Most importantly, we show that the negative wealth effects are due to the reduction in the opportunities for risk diversification by foreign insurance firms. This reduction in diversification opportunities in the largest insurance market results from the GLBA. Because the GLBA requires that the entire foreign financial institution be well capitalized, it may be difficult for many foreign firms to meet the new standards. In addition, the GLBA creates more competition in the insurance market by allowing domestic commercial banks to participate in this market as insurance agents and FHCs to operate a full range of insurance businesses. Further, these domestic firms have a home field advantage over the foreign firms. Anecdotal evidences also support the argument that the GLBA created barriers to entry in the U.S. insurance industry for foreign

insurance firms. Figure 3 shows that after 1998, the number of acquisitions by foreign firms of U.S. insurance firms fell to less than half. Blanden (2000) also reports that the number of foreign banks in the U.S. has been declining, offering further evidence of barriers to entry in U.S. financial markets.

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VITA

Abdullah Al Mamun was the first child of Prof. Sazzad Hossain and Qamrun Nahar. He was born and raised in Dhaka, Bangladesh and passed Secondary School Certificate from Mohammadpur Govt. High School in 1987 and Higher Secondary Certificate from Notre Dame College in 1989. He then went to University of Dhaka and received his Bachelor and Masters degree in Economics in 1994 and 1996 respectively. After this he worked for The Population Council for seven months, and then worked for North South University from summer 1997 to summer 1998, in Dhaka, before he came to North America for further graduate studies. He received his M.A. in Economics from University of Western Ontario, Ontario, Canada in summer of 1999. In August of 1999 he went to the University of New Orleans and studied under the supervision of Prof. Kabir Hassan and Prof. Neal Maroney, and received Doctorate of Philosophy in Financial Economics in spring of 2003. He was married to Nahid Nasreen in June 2000.

DOCTORAL EXAMINATION REPORT

CANDIDATE: Abdullah Al Mamun

MAJOR FIELD: Financial Economics

TITLE OF DISSERTATION: "Wealth Effects of the Gramm-Leach-Bliley Act on the Financial Services Industry"

APPROVED:



Major Professor & Co-Chair
M. Kabir Hassan



Major Professor & Co-Chair
Neal Maroney



Dean of the Graduate School
Robert C. Cashner

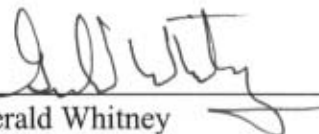
EXAMINING COMMITTEE:



Atsuyuki Naka



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DATE OF EXAMINATION: May 8, 2003